

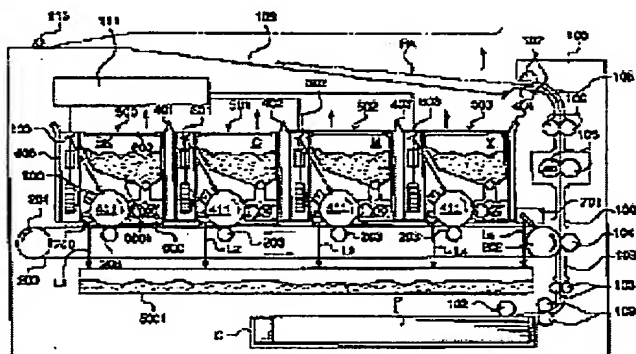
IMAGE FORMING DEVICE

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Abstract of JP8190245

PURPOSE: To facilitate the exchange of image forming process units and the supply of toner by attaching/detaching plural image forming process units in the direction away from a transfer body, with respect to a belt-like formed transfer body. **CONSTITUTION:** Plural image exposing devices 300-303 and image forming process units 500-503 which are alternately provided in parallel, toner images formed on a photoreceptor drum 411 by the plural image exposing devices 300-303 and the image forming process units 500-503 respectively are successively superimposed on the belt-like formed transfer body 200, to form an image and then, it is transferred to a recording medium P. When the plural image forming process units 500-503 are attached to/detached from an image forming device 100, the plural process units 500-503 are provided to attach/detach in the direction away from the transfer body P, with respect to the belt-like formed transfer body 200. Therefore, the supply of the toner of a developing device 600 and the attachment to/detachment from the image forming device 100 is easily attained.



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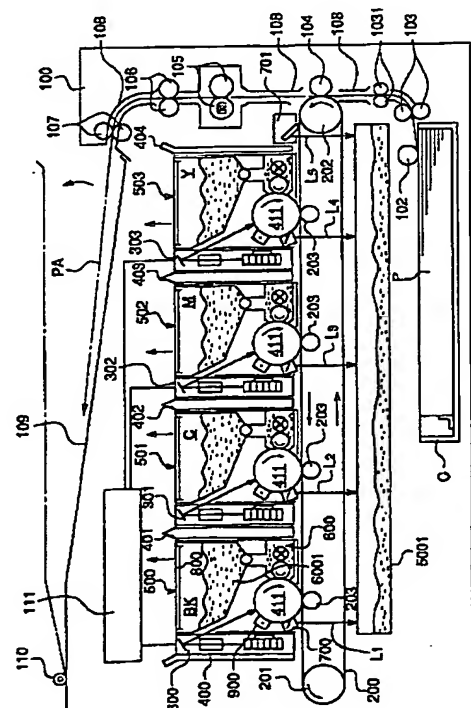
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(54) 【発明の名称】 画像形成装置

(57) 【要約】

【目的】 潜像形成用の像露光装置と、感光体ドラム、現像装置等を内蔵した画像形成用プロセスユニットを各々ベルト状に形成した像担持体に並設配置することにより各像露光装置の交換と、感光体ドラム、現像装置等を内蔵した画像形成用プロセスユニットの交換及びトナーの補給を容易にすることを目的としたものである。

【構成】 複数の像露光手段と、該像露光手段と交互に並設した複数の画像形成用プロセスユニットとを有し、複数の像露光手段と、画像形成プロセスユニットで前記像担持体に各々形成されるトナー像を、順次ベルト状に形成した転写体に重ね合わせて画像を形成後、記録紙に転写する画像形成装置に於いて、画像形成装置より、前記複数の画像形成用プロセスユニットとを着脱する時、前記ベルト状に形成した転写体に対し、前記複数の画像形成プロセスユニットを前記転写体に対し離間する方向に着脱するように設けたことを特徴とする画像形成装置。



(2)

1

【特許請求の範囲】

【請求項1】 複数の像露光手段と、該像露光手段と交互に並設した複数の画像形成用プロセスユニットとを有し、複数の像露光手段と、画像形成プロセスユニットで前記像担持体に各々形成されるトナー像を、順次ベルト状に形成した転写体に重ね合わせて画像を形成後、記録紙に転写する画像形成装置に於いて、画像形成装置より、前記複数の画像形成用プロセスユニットとを着脱する時、前記ベルト状に形成した転写体に対し、前記複数の画像形成プロセスユニットを前記転写体に対し離間する方向に着脱するように設けたことを特徴とする画像形成装置。

【請求項2】 前記画像形成装置に設けた原稿読取装置を、前記画像形成位置より移動可能にしたことにより、前記複数の像露光手段と、複数の画像形成プロセスユニットの上方を開放し、該複数の画像形成プロセスユニットを前記転写体に対し離間するように設けたことを特徴とする請求項1記載の画像形成装置。

【請求項3】 前記ベルト状に形成した転写体を懸架部材で水平方向に張設し、前記転写体に沿って前記複数の像露光手段と、複数の画像形成プロセスユニットを設けたことを特徴とする請求項1記載の画像形成装置。

【請求項4】 前記懸架部材で略縦方向に張設した前記ベルト状に形成した転写体と、前記転写体に沿って縦方向に配置された複数の像露光手段と、複数の画像形成プロセスユニットよりなることを特徴とする請求項1記載の画像形成装置。

【請求項5】 前記懸架部材で傾斜して張設した前記ベルト状に形成した転写体と、前記転写体に沿って傾斜配置された複数の像露光手段と、複数の画像形成プロセスユニットよりなることを特徴とする請求項1記載の画像形成装置。

【請求項6】 複数の像露光手段と、該像露光手段とを交互に並設した複数の画像形成用プロセスユニットとを有し、複数の像露光手段と、画像形成プロセスユニットで前記像担持体に各々形成されるトナー像を、順次ベルト状に形成した転写体に重ね合わせて画像を形成後、記録紙に転写する画像形成装置に於いて、前記複数の画像形成用プロセスユニットの像担持体をクリーニングするクリーニング手段と、ベルト状に形成した前記転写体をクリーニングするクリーニング手段と、前記トナー画像を転写後、前記クリーニング手段によりクリーニングされたトナーを回収する共通の回収手段とを有することを特徴とする画像形成装置。

【請求項7】 複数の像露光手段と、該像露光手段と交互に並設した画像形成用プロセスユニットとを有し、複数の像露光手段と、前記画像形成用プロセスユニットで前記像担持体に各々形成されるトナー像を、順次ベルト状に形成した転写体に重ね合わせて画像を形成後、記録紙に転写する画像形成装置に於いて、前記複数の画像形

2

成用プロセスユニットを前記ベルト状に形成した転写体の下位置に配置すると共に、懸架部材で懸架した前記ベルト状に形成した転写体を、画像形成位置より移動可能とし、画像形成装置より少なくとも前記複数の画像形成用プロセスユニットを着脱可能としたことを特徴とする画像形成装置。

【請求項8】 画像形成装置に設けた原稿読取装置と共に前記転写体を移動可能とし、画像形成装置より少なくとも前記複数の画像形成用プロセスユニットを着脱可能としたことを特徴とする請求項7記載の画像形成装置。

【請求項9】 前記複数の画像形成用プロセスユニットはカラー画像形成用プロセスユニットであることを特徴とする請求項1～8のいずれか1項に記載の画像形成装置。

【請求項10】 前記複数の像露光手段と、複数の画像形成プロセスユニットは画像形成装置に設けた案内保持手段により所定位置に各々保持されていることを特徴とする請求項1～8のいずれか1項に記載の画像形成装置。

【発明の詳細な説明】

【0001】

【産業上の利用分野】 本発明は画像形成装置に於いて、像露光装置と、画像形成用プロセスユニットにより像担持体に画像を形成すると共に、前記像露光装置と、画像形成用プロセスユニットの前記像担持体に形成した画像を転写体に転写し、更に該転写体より記録紙に前記画像を転写する画像形成装置で、前記転写体より画像形成用プロセスユニットを簡単に着脱させるために改良した画像形成装置に関する。

【0002】

【従来の技術】 回動可能な懸架部材に懸架されたベルト状の感光体状である像担持体に対して、複数の像担持体（以下感光体ドラムと云う）を中心に各々帯電器、潜像形成用露光装置、現像装置、転写器、クリーニング装置の順に配置されている。そして前記感光体ドラムを中心に配置された各部材は、現像器を並べて配設する構成は、例えば実開平3-77940号、及び実開平3-77941号等で知られている。前記構成では一般にカラー画像形成に用いられており、前記感光体ドラムに帯電器と、現像装置及びクリーニング装置を1個の画像形成プロセスユニットで構成し、該各カラートナーを有する画像形成用プロセスユニットに対応して、例えばプリンタの場合は半導体レーザ発光体を光源としてポリゴンミラー、fθレンズ、反射ミラー等を内蔵した潜像形成用露光装置を上部位置に別個に設けている。更に複写装置の場合は、前記潜像形成用露光装置の上部に原稿読取装置が配置されている。

【0003】

【発明が解決しようとする課題】 前記のように構成された画像形成装置は各画像形成用プロセスユニット内の現

(3)

3

像装置にトナーを補給する時には、画像形成用プロセスユニットの上部に設けた潜像形成用の像露光装置を上部位置より側方に移動して前記現像装置のトナー補給口を開放しなければならない。又、感光体ドラムの交換等で画像形成用プロセスユニットを画像形成装置本体より着脱する場合も、前記同様に前記潜像形成用の像露光装置を移動するか、取り外す必要がある。そこで前記潜像形成用の像露光装置で感光体ドラムを露光する場合、画像形成面の結像を正確にするため、厳格な位置合わせが行えるように構成されている。しかるに前記のように画像形成装置より前記潜像形成用の像露光装置を移動させたり、取り外しを行っているとき位置合わせに誤差が生じ、画像の焦点が狂い正確な画像を形成出来なくなる。更に前記のような現像装置のトナー補給と、感光体ドラムの交換時に前記前記潜像形成用露光装置を移動するか、取り外す作業を行う事は、記録又は複写作業を長時間中断しなければならず、記録又は複写作業の効率を著しく低下させる。

【0004】本発明は、前記の欠点を改善するため特に考えられたものである。即ち、潜像形成用の像露光装置と、感光体ドラム、現像装置等を内蔵した画像形成用プロセスユニットを各々ベルト状に形成した像担持体に並設配置することにより各像露光装置の交換と、感光体ドラム、現像装置等を内蔵した画像形成用プロセスユニットの交換及びトナーの補給を容易にすることを目的としたものである。

【0005】

【課題を解決するための手段】前記目的のため、請求項1に於いて、複数の像露光手段と、該像露光手段と交互に並設した複数の画像形成用プロセスユニットとを有し、複数の像露光手段と、画像形成プロセスユニットで前記像担持体に各々形成されるトナー像を、順次ベルト状に形成した転写体に重ね合わせて画像を形成後、記録紙に転写する画像形成装置に於いて、画像形成装置より、前記複数の画像形成用プロセスユニットとを着脱する時、前記ベルト状に形成した転写体に対し、前記複数の画像形成プロセスユニットを前記転写体に対し離間する方向に着脱するように設けたこと。請求項2に於いて、前記画像形成装置に設けた原稿読取装置を、前記画像形成位置より移動可能にしたことにより、前記複数の像露光手段と、複数の画像形成プロセスユニットの上方を開放し、該複数の画像形成プロセスユニットを前記転写体に対し離間するように設けたこと。請求項3に於いて、前記ベルト状に形成した転写体を懸架部材で水平方向に張設し、前記転写体に沿って前記複数の像露光手段と、複数の画像形成プロセスユニットを設けたこと。請求項4に於いて、前記懸架部材で略縦方向に張設した前記ベルト状に形成した転写体と、前記転写体に沿って縦方向に配置された複数の像露光手段と、複数の画像形成プロセスユニットよりなること。請求項5に於いて、前

4

記懸架部材で傾斜して張設した前記ベルト状に形成した転写体と、前記転写体に沿って傾斜配置された複数の像露光手段と、複数の画像形成プロセスユニットよりなること。請求項6に於いて、複数の像露光手段と、該像露光手段とを交互に並設した複数の画像形成用プロセスユニットとを有し、複数の像露光手段と、画像形成プロセスユニットで前記像担持体に各々形成されるトナー像を、順次ベルト状に形成した転写体に重ね合わせて画像を形成後、記録紙に転写する画像形成装置に於いて、前記複数の画像形成用プロセスユニットの像担持体をクリーニングするクリーニング手段と、ベルト状に形成した前記転写体をクリーニングするクリーニング手段と、前記トナー画像を転写後、前記クリーニング手段によりクリーニングされたトナーを回収する共通の回収手段とを有すること。請求項7に於いて、複数の像露光手段と、該像露光手段と交互に並設した画像形成用プロセスユニットとを有し、複数の像露光手段と、前記画像形成用プロセスユニットで前記像担持体に各々形成されるトナー像を、順次ベルト状に形成した転写体に重ね合わせて画像を形成後、記録紙に転写する画像形成装置に於いて、前記複数の画像形成用プロセスユニットを前記ベルト状に形成した転写体の下位置に配置すると共に、懸架部材で懸架した前記ベルト状に形成した転写体を、画像形成位置より移動可能とし、画像形成装置より少なくとも前記複数の画像形成用プロセスユニットを着脱可能としたこと。請求項8に於いて、画像形成装置に設けた原稿読取装置と共に前記転写体を移動可能とし、画像形成装置より少なくとも前記複数の画像形成用プロセスユニットを着脱可能としたこと。請求項9に於いて、前記複数の画像形成用プロセスユニットはカラー画像形成用プロセスユニットであること。請求項10に於いて、前記複数の像露光手段と、複数の画像形成プロセスユニットは画像形成装置に設けた案内保持手段により所定位置に各々保持されていることによって達成される。

【0006】

【実施例】本発明の実施例をその作用と共に図を用いて説明する。

【0007】図1は本発明の一実施例で、例えばカラープリンタの画像形成装置100を示す。図において300、301、302、303は半導体レーザ発光体と、ポリゴンミラー及びfθレンズと、反射ミラーを各々内蔵した像露光手段で、イエロー(Y)、マゼンタ(M)、シアン(C)、黒(BK)用の現像を行うために、前記像露光手段300、301、302、303と並設するように画像形成用プロセスユニット500、501、502、503が設けられている。そして前記像露光手段300、301、302、303と、画像形成用プロセスユニット500、501、502、503を、回転する懸架部材201、202に対し水平方向に懸架したベルト状転写体200に沿って図示のように交互に並設して設ける。前記画像形成用プロセスユニット500、501、502、503は、画

(4)

5

像形成用プロセスユニット500で示すように、感光体ドラム411と、該感光体ドラム411の回転方向に沿って帯電器900、トナー補給部を備えた現像装置600、転写器203、クリーニング装置700が各々設けられており、感光体ドラム411には並設され像露光手段300より露光され静電潜像が形成される様に構成されている。前記のように構成された前記像露光手段300、301、302、303と、画像形成用プロセスユニット500、501、502、503は、案内保持部材400、401、402、403、404で図示はしないが例えば突起部材、ピン等で所定位置に案内され、保持固定されている。更に、前記各画像形成用プロセスユニット500、501、502、503内の感光体ドラムをクリーニングした後の廃棄トナーを收容する廃棄トナー容器5001が設けられている。前記クリーニング装置700と共に他のクリーニング装置から廃棄トナー案内路L1、L2、L3、L4と、前記ベルト状転写体200に設けたクリーニング装置701よりも廃棄トナー案内路L5が各々設けられ、前記廃棄トナー容器5001に接続している。

【0008】前記のように構成した像露光手段300、301、302、303と、画像形成用プロセスユニット500、501、502、503及びベルト状転写体200でカラー画像が形成される。先ずイエロートナー（Y）を現像する画像形成用プロセスユニット503内の感光体ドラム411面に帯電器900で電荷を付与し、次に外部の画像信号を受ける入力装置111の画像信号で制御される像露光手段303で感光体ドラム411面に静電潜像を形成し、現像装置600でイエロートナー（Y）の現像を開始する。同時に前記ベルト状転写体200も矢印方向に移動を開始し、前記感光体ドラム411面に形成されたイエロートナー（Y）像を前記ベルト状転写体200に転写器203を用いて転写する。次に前記同様の操作で画像情報によりマゼンタトナー（M）を有する画像形成用プロセスユニット502の感光体ドラム411に形成したマゼンタトナー（M）像を、前記ベルト状転写体200に形成したイエロートナー（Y）像に合致するように重ね合わせて転写器203で転写し、更に次に前記同様の操作で画像情報によりシアントナー（C）を有する画像形成用プロセスユニット501の感光体ドラム411に形成したシアントナー（C）像を、前記ベルト状転写体200に形成したマゼンタトナー像に合致するように重ね合わせて転写器203で転写する。更に前記画像形成用プロセスユニット500は黒トナー（BK）が現像装置600に収納されており、前記同様の操作でベルト状転写体200面に黒トナー（BK）像を形成する。

【0009】以上の動作で前記ベルト状転写体200面にカラートナーによるカラー画像が形成され、ベルト状転写体200は回転する懸架部材201、202で反転動作して、記録紙転写部材104方向に移動する。一方前記廃棄トナー容器5001の下位置には記録紙Pを内蔵した給紙カセットCが設けられており、最上部の記録紙Pを給紙する給紙ローラ102により給紙され、記録紙Pは重送防止装置1

6

03により確実に一枚の記録紙Pが記録紙案内内部108に案内搬送される。前記記録紙Pは一旦レジストローラ1031で停止し、ベルト状転写体200面に形成したカラー画像と合致するように給紙を開始し、前記記録紙転写部材104で記録紙Pにカラー画像を転写する。

【0010】次に記録紙Pは熱定着装置105に搬送され、記録紙Pに前記カラー画像を定着した後、搬送ローラ106と、排紙ローラ107で排紙トレイ109に記録紙PAとして排紙される。

【0011】カラー画像の転写を行った後、ベルト状転写体200面はクリーニング装置701にてクリーニングされ、新たな画像転写が行われる。

【0012】又前記排紙トレイ109は画像形成装置100の一部に設けた支軸110により開放可能に設けられており、該排紙トレイ109を開放する事で、前記イエロートナー（Y）、マゼンタトナー（M）、シアントナー（C）、黒トナー（BK）を収納した画像形成用プロセスユニット500、501、502、503の上部を開放することが可能となる。画像形成用プロセスユニット500、501、502、503に設けた現像装置600のトナー収納部に設けた蓋800を開放する事で簡単にトナー補給を行う事が出来る。更に、前記画像形成用プロセスユニット500、501、502、503を、案内保持部材401、402、403、404を介して簡単に着脱する事が可能で、例えば故障時の修理、又は感光体ドラム411の交換及び清掃等を迅速に行う事が出来る。

【0013】一方前記クリーニング装置700、701より排出される廃棄トナーは、廃棄トナー案内路L1、L2、L3、L4、L5を介して共通の廃棄トナー容器5001に廃棄される。

【0014】図2は本発明の一実施例で、例えば複写装置の画像形成装置112を示す。図1と同様に、300、301、302、303は半導体レーザ発光体と、ポリゴンミラー及びfθレンズと、反射ミラーを各々内蔵した像露光手段で、イエロー（Y）、マゼンタ（M）、シアン

（C）、黒（BK）の現像を行うために、前記像露光手段300、301、302、303と並設するように画像形成用プロセスユニット500、501、502、503が設けられている。そして前記像露光手段300、301、302、303と、画像形成用プロセスユニット500、501、502、503を、回転する懸架部材201、202に対し水平方向に懸架したベルト状転写体200に沿って図示のように交互に並設して設ける。前記画像形成用プロセスユニット500、501、502、503は、画像形成用プロセスユニット500で示すように、感光体ドラム411と、該感光体ドラム411の回転方向に沿って帯電器900、トナー補給部を備えた現像装置600、転写器203、クリーニング装置700が各々設けられており、感光体ドラム411には並設され像露光手段300より露光され静電潜像が形成される様に構成されている。前記のように構成された像露光手段300、301、302、303と、画像形成用

(5)

7

プロセスユニット500, 501, 502, 503は、案内保持部材400, 401, 402, 403, 404で図示はしないが例えば突起部材、ピン等で所定位置に案内され、保持固定されている。更に、前記各画像形成用プロセスユニット500, 501, 502, 503内の感光体ドラムをクリーニングした後の廃棄トナーを収容する廃棄トナー容器5001が設けられている。前記クリーニング装置700と共に他のクリーニング装置から廃棄トナー案内路L1, L2, L3, L4と、前記ベルト状転写体200に設けたクリーニング装置701よりも廃棄トナー案内路L5が各々設けられ、前記廃棄トナー容器5001に接続している。

【0015】更に本実施例には画像形成装置112の上部に原稿台117を設け、原稿を露光する露光ランプ114と、ミラーを含めた光学系115と、原稿像を受光するCCD等の受光素子116を各々設けた露光部113が設けられ、画像形成装置112の一端で支軸1131により開放可能に設けられている。

【0016】前記のように構成した像露光手段300, 301, 302, 303と、画像形成用プロセスユニット500, 501, 502, 503及びベルト状転写体200でカラー画像が形成される。先ず原稿台117上のカラー原稿Dを露光ランプ114で順次露光し、光学系115を介して受光素子116に画像情報を入力し、更に前記画像情報を入力装置111に入力する。又同時にイエロートナー(Y)を現像する画像形成用プロセスユニット503内の感光体ドラム411面に帯電器900で電荷を付与し、次に前記の画像情報を受ける前記入力装置111の画像信号で制御されている像露光手段303で、感光体ドラム411面に静電潜像を形成し、現像装置600でイエロートナー(Y)の現像を開始する。同時に前記ベルト状転写体200も矢印方向に移動を開始し、前記感光体ドラム411面に形成されたイエロートナー

(Y)像を前記ベルト状転写体200に転写器203を用いて転写する。次に前記同様の操作で画像情報によりマゼンタトナー(M)を有する画像形成用プロセスユニット502の感光体ドラム411に形成したマゼンタトナー(M)像を、前記ベルト状転写体200に形成したイエロートナー

(Y)像に合致するように重ね合わせて転写器203で転写し、更に次に前記同様の操作で画像情報によりシアントナー(C)や、黒トナー(BK)を有する画像形成用プロセスユニット501, 500の感光体ドラム411に形成したシアントナー(C)像や、黒トナー(BK)像を、前記ベルト状転写体200に形成したトナー像に合致するように重ね合わせて転写器203で転写する。尚前記ベルト状転写体200に画像の転写を終了した感光体ドラム411と順次クリーニング装置700でクリーニングされる。

【0017】以上の動作で前記ベルト状転写体200面にカラートナーによるカラー画像が形成され、ベルト状転写体200は回転する懸架部材201, 202で反転動作して、記録紙転写部材104方向に移動する。一方前記廃棄トナー容器5001の下位置には記録紙P, P1, P2を内蔵した

8

給紙カセットC, C1, C2が設けられており、原稿Dのサイズか、希望のサイズに応じて最上部の記録紙P, P1, P2を給紙する給紙ローラ102, 1021, 1022により給紙され、記録紙Pは重送防止装置1032, 1033, 1034により確実に一枚の記録紙Pが記録紙案内部108に案内搬送される。前記記録紙は一旦レジストローラ1031で停止し、ベルト状転写体200面に形成したカラー画像と合致するように給紙を開始し、前記記録紙転写部材104で記録紙Pにカラー画像を転写する。次に記録紙Pは熱定着装置105に搬送され、記録紙Pに前記カラー画像を定着した後、搬送ローラ106と、排紙ローラ107で排紙トレイ1091に記録紙PAとして排紙される。

【0018】カラー画像の転写を行った後、ベルト状転写体200面はクリーニング装置701にてクリーニングされ、新たな画像転写が行われる。

【0019】本実施例は露光部113を支軸1131を中心に開放する事で、前記イエロートナー(Y), マゼンタトナー(M), シアントナー(C), 黒トナー(BK)を収納した画像形成用プロセスユニット500, 501, 502, 503の上部を開放することが可能となる。画像形成用プロセスユニット500, 501, 502, 503に設けた現像装置600のトナー収納部に設けた蓋800を開放する事で簡単にトナー補給を行う事が出来る。更に、前記画像形成用プロセスユニット500, 501, 502, 503を、案内保持部材401, 402, 403, 404を介して簡単に着脱する事が可能で、例えば故障時の修理、又は感光体ドラム411の交換及び清掃等を迅速に行う事が出来る。

【0020】一方前記クリーニング装置700, 701より排出される廃棄トナーは、廃棄トナー案内路L1, L2, L3, L4, L5を介して共通の廃棄トナー容器5001に廃棄される。

【0021】図3は像露光手段300としてLED発光体3001を設けたもので、像露光手段300本体に対しLED発光体3001の一端が軸3002で回転自在に設けられ、使用時には図示の様に感光体ドラム411面に向けて固定し、例えば画像形成用プロセスユニット500又はLED発光体3001を設けた像露光手段300本体を画像形成装置100に対し着脱する時は、一点鎖線の位置に収納する。

【0022】図4は本発明の他の一実施例で、例えばカラープリンタの画像形成装置118を示す。特に本発明は像露光手段300, 301, 302, 303と、画像形成用プロセスユニット500, 501, 502, 503を、回転する懸架部材201, 202に対し傾斜して懸架したベルト状転写体200に沿って図示のように交互に傾斜して縦方向に重ねて並設されている。図1と同様に300, 301, 302, 303は半導体レーザー発光体と、ポリゴンミラー及びfθレンズと、反射ミラーを各々内蔵した像露光手段で、イエロー(Y), マゼンタ(M), シアン(C), 黒(BK)用の現像を行うために、前記像露光手段300, 301, 302, 303と傾斜して並設するように画像形成用プロセスユニット500, 5

(6)

9

01, 502, 503が設けられている。前記画像形成用プロセスユニット500, 501, 502, 503は、画像形成用プロセスユニット500で示すように、感光体ドラム411と、該感光体ドラム411の回転方向に沿って帯電器900、トナー補給部を備えた現像装置600、転写器203、クリーニング装置700が各々設けられており、感光体ドラム411には上位置に設けた像露光手段300より露光され静電潜像が形成される様に構成されている。前記のように構成された前記像露光手段300, 301, 302, 303と、画像形成用プロセスユニット500, 501, 502, 503は、案内保持部材400, 401, 402, 403, 404, 405, 406, 407, 408で図示はしないが例えば突起部材、ピン等で所定位置に案内され、載置して保持固定されている。

【0023】前記のように構成した像露光手段300, 301, 302, 303と、画像形成用プロセスユニット500, 501, 502, 503及び傾斜配置したベルト状転写体200でカラー画像が形成される。先ずイエロートナー（Y）を現像する画像形成用プロセスユニット500内の感光体ドラム411面に帯電器900で電荷を付与し、次に外部の画像信号を受ける入力装置111の画像信号で制御される像露光手段300で感光体ドラム411面に静電潜像を形成し、現像装置600でイエロートナー（Y）の現像を開始する。同時に前記ベルト状転写体200も矢印方向に移動を開始し、前記感光体ドラム411面に形成されたイエロートナー

（Y）像を前記ベルト状転写体200に転写器203を用いて転写する。次に前記同様の操作で画像情報によりマゼンタトナー（M）を有する画像形成用プロセスユニット501の感光体ドラム411に形成したマゼンタトナー（M）像を、前記ベルト状転写体200に形成したイエロートナー

（Y）像に合致するように重ね合わせて転写器203で転写し、更に次に前記同様の操作で画像情報によりシアントナー（C）や、黒トナー（BK）を有する画像形成用プロセスユニット501, 503の感光体ドラム411に形成したシアントナー（C）像や黒トナー（BK）像を、前記ベルト状転写体200に形成したマゼンタトナー（M）像に合致するように重ね合わせて転写器203で転写する。更に前記画像形成用プロセスユニット503は黒トナー（BK）が現像装置600に収納されており、前記同様の操作でベルト状転写体200面に黒トナー（BK）像を形成する。

【0024】以上の動作で前記ベルト状転写体200面にカラートナーによるカラー画像が形成され、ベルト状転写体200は回転する懸架部材201, 202で記録紙転写部材104方向に移動する。一方画像形成装置118の下位置には記録紙Pを内蔵した給紙カセットCが設けられており、最上部の記録紙Pを給紙する給紙ローラ102により給紙し、記録紙Pは重送防止装置103により確実に一枚の記録紙Pが記録紙案内部108に案内搬送される。前記記録紙Pは一旦レジストローラ1031で停止し、ベルト状転写体200面に形成したカラー画像と合致するように給紙を

10

開始し、前記記録紙転写部材104で記録紙Pにカラー画像を転写する。次に記録紙Pは熱定着装置105に搬送され、記録紙Pに前記カラー画像を定着した後、排紙ローラ107で排紙トレイ1181に記録紙PAとして排紙される。

【0025】カラー画像の転写を行った後、ベルト状転写体200面はクリーニング装置701にてクリーニングされ、反転して新たな画像転写が行われる。

【0026】又画像形成装置118の一部に開放扉1182が支軸1183により開放可能に設けられており、前記イエロートナー（Y）、マゼンタトナー（M）、シアントナー（C）、黒トナー（BK）を収納した画像形成用プロセスユニット500, 501, 502, 503の側方を開放することが可能となる。傾斜配置された画像形成用プロセスユニット500, 501, 502, 503には配置された位置で前記トナーを補給する事が可能である。更に前記案内保持部材402, 404, 406, 408に沿って現像装置600か、前記画像形成用プロセスユニット500, 501, 502, 503を引き出す事でトナー収納部を開放し、簡単にトナー補給を行う事が出来る。更に、前記画像形成用プロセスユニット500, 501, 502, 503を、案内保持部材401, 402, 403, 404, 405, 406, 407, 408で案内し簡単に着脱する事が可能で、例えば故障時の修理、又は感光体ドラム411の交換及び清掃等を迅速に行う事が出来る。

【0027】又本実施例は、ベルト状転写体200を傾斜配置し、該傾斜を利用してクリーニング装置701を配置したのでクリーニング性能を大幅に向上出来た。

【0028】図5は本発明の他の一実施例で、例えばカラープリンタの画像形成装置119を示す。図において300, 301, 302, 303は半導体レーザ発光体と、ポリゴンミラー及びfθレンズと、反射ミラーを各々内蔵した像露光手段で、イエロー（Y）、マゼンタ（M）、シアン（C）、黒（BK）用の現像を行うために、前記像露光手段300, 301, 302, 303と縦方向に画像形成用プロセスユニット500, 501, 502, 503が設けられている。そして前記像露光手段300, 301, 302, 303と、画像形成用プロセスユニット500, 501, 502, 503を回転する懸架部材201, 202に対し縦方向に懸架したベルト状転写体200に沿って積み重ねた状態で交互に設けられている。前記画像形成用プロセスユニット500, 501, 502, 503は、図1と同様に画像形成用プロセスユニット500で示すように、感光体ドラム411と、該感光体ドラム411の回転方向に沿って帯電器900、トナー補給部を備えた現像装置600、転写器203、クリーニング装置700が各々設けられており、感光体ドラム411には上部に設けた像露光手段300より露光され静電潜像が形成される様に構成されている。前記のように構成された前記像露光手段300, 301, 302, 303と、画像形成用プロセスユニット500, 501, 502, 503は、案内保持部材400, 401, 402, 403, 404, 405, 406, 407, 408で図示はしないが例えば突起部材、ピン等で所定位置に案内され、保持固定されている。更に、前

(7)

11

記各画像形成用プロセスユニット500, 501, 502, 503内の感光体ドラムをクリーニングした後の廃棄トナーを收容する廃棄トナー容器5001が、画像形成装置119の下位置に設けられている。前記クリーニング装置700と共に他のクリーニング装置から廃棄トナー案内路L1, L2, L3, L4と、前記ベルト状転写体200に設けたクリーニング装置701よりも廃棄トナー案内路L5が各々設けられ、前記廃棄トナー容器5001に接続している。

【0029】前記のように構成した像露光手段300, 301, 302, 303と、画像形成用プロセスユニット500, 501, 502, 503及びベルト状転写体200でカラー画像が形成される。先ずイエロートナー(Y)を現像する画像形成用プロセスユニット503内の感光体ドラム411面に帯電器900で電荷を付与し、次に外部の画像信号を受ける入力装置111の画像信号で制御される像露光手段303で感光体ドラム411面に静電潜像を形成し、現像装置600でイエロートナー(Y)の現像を開始する。同時に前記ベルト状転写体200も矢印方向に移動を開始し、前記感光体ドラム411面に形成されたイエロートナー(Y)像を前記ベルト状転写体200に転写器203を用いて転写する。次に前記同様の操作で画像情報によりマゼンタトナー(M)を有する画像形成用プロセスユニット502の感光体ドラム411に形成したマゼンタトナー(M)像を、前記ベルト状転写体200に形成したイエロートナー(Y)像に合致するように重ね合わせて転写器203で転写し、更に次に前記同様の操作で画像情報によりシアントナー(C)を有する画像形成用プロセスユニット501の感光体ドラム411に形成したシアントナー(C)像を、前記ベルト状転写体200に形成したマゼンタトナー(M)像に合致するように重ね合わせて転写器203で転写する。更に前記画像形成用プロセスユニット500には黒トナー(BK)が現像装置600に収納されており、前記同様の操作でベルト状転写体200面に黒トナー(BK)像を形成する。

【0030】以上の動作で前記ベルト状転写体200面にカラートナーによるカラー画像が形成され、ベルト状転写体200は回転する懸架部材201, 202で移動してカラー画像が記録紙転写部材104方向に移動する。一方画像形成装置119の上位置には記録紙Pを内蔵した給紙カセットCが設けられており、最上部の記録紙Pを給紙ローラ102により給紙し、記録紙Pは重送防止装置103により確実に一枚の記録紙Pが記録紙案内部108に案内搬送される。前記記録紙Pは一旦レジストローラ1031で停止し、ベルト状転写体200面に形成したカラー画像と合致するように給紙を開始し、前記記録紙転写部材104で記録紙Pにカラー画像を転写する。次に記録紙Pは熱定着装置105に搬送され、記録紙Pに前記カラー画像を定着した後、排紙ローラ107で排紙トレイ1191に記録紙PAとして排紙される。

【0031】カラー画像の転写を行った後、ベルト状転写体200面はクリーニング装置701にてクリーニングさ

12

れ、新たな画像転写が行われる。

【0032】又前記画像形成装置119の一部に開放扉1192が支軸1191で開放可能に設けられており、該開放扉1192を開放する事で、前記イエロートナー(Y), マゼンタトナー(M), シアントナー(C), 黒トナー(BK)を収納した画像形成用プロセスユニット500, 501, 502, 503を上部を開放することが可能となる。画像形成用プロセスユニット500, 501, 502, 503を案内保持部材402, 404, 406, 408で案内させて側方に引き出し現像装置600のトナー収納部に簡単にトナー補給を行う事が出来る。更に、前記画像形成用プロセスユニット500, 501, 502, 503を別々に案内保持部材401, 402, 403, 404, 406, 407, 408を介して簡単に着脱する事が可能で、例えば故障時の修理、又は感光体ドラム411の交換及び清掃等を迅速に行う事が出来る。

【0033】一方前記クリーニング装置700, 701より排出される廃棄トナーは、廃棄トナー案内路L1, L2, L3, L4, L5を介して画像形成装置119の下位置に設けた共通の廃棄トナー容器5001に廃棄される図6は本発明の他の一実施例で、例えばカラープリンタの画像形成装置120を示す。図において300, 301, 302, 303は半導体レーザ発光体と、ポリゴンミラー及びfθレンズと、反射ミラーを各々内蔵した像露光手段で、イエロー(Y), マゼンタ(M), シアン(C), 黒(BK)用の現像を行うために、図5と同様に前記像露光手段300, 301, 302, 303と縦方向に画像形成用プロセスユニット500, 501, 502, 503が設けられている。そして前記像露光手段300, 301, 302, 303と、画像形成用プロセスユニット500, 501, 502, 503を回転する懸架部材201, 202に対し縦方向に懸架したベルト状転写体200に沿って積み重ねた状態で交互に設けられている。前記画像形成用プロセスユニット500, 501, 502, 503は、図1と同様に画像形成用プロセスユニット500で示すように、感光体ドラム411と、該感光体ドラム411の回転方向に沿って帯電器900、トナー補給部を備えた現像装置600、転写器203、クリーニング装置700が各々設けられており、感光体ドラム411には上部に設けた像露光手段300より露光され静電潜像が形成される様に構成されている。前記のように構成された前記像露光手段300, 301, 302, 303と、画像形成用プロセスユニット500, 501, 502, 503は、案内保持部材400, 401, 402, 403, 404, 405, 406, 407, 408で図示はしないが例えば突起部材、ピン等で所定位置に案内され、保持固定されている。更に、前記各画像形成用プロセスユニット500, 501, 502, 503内の感光体ドラムをクリーニングした後の廃棄トナーを收容する廃棄トナー容器5001が、画像形成装置119の下位置に設けられている。前記クリーニング装置700と共に他のクリーニング装置から廃棄トナー案内路L1, L2, L3, L4と、前記ベルト状転写体200に設けたクリーニング装置701よりも廃棄トナー案内路L5が各々設けられ、前記廃棄トナー

(8)

13

容器5001に接続している。

【0034】前記のように構成した像露光手段300, 301, 302, 303と、画像形成用プロセスユニット500, 501, 502, 503及びベルト状転写体200でカラー画像が形成される。先ずイエロートナー（Y）を現像する画像形成用プロセスユニット500内の感光体ドラム411面に帯電器900で電荷を付与し、次に外部の画像信号を受ける入力装置111の画像信号で制御される像露光手段303で感光体ドラム411面に静電潜像を形成し、現像装置600でイエロートナー（Y）の現像を開始する。同時に前記ベルト状転写体200も矢印方向に移動を開始し、前記感光体ドラム411面に形成されたイエロートナー（Y）像を前記ベルト状転写体200に転写器203を用いて転写する。次に前記同様の操作で画像情報によりマゼンタトナー（M）を有する画像形成用プロセスユニット501の感光体ドラム411に形成したマゼンタトナー（M）像を、前記ベルト状転写体200に形成したイエロートナー（Y）像に合致するように重ね合わせて転写器203で転写し、更に次に前記同様の操作で画像情報によりシアントナー（C）や、黒トナー（BK）を有する画像形成用プロセスユニット502, 503の感光体ドラム411に形成したシアントナー

（C）像や、黒トナー（BK）像を、前記ベルト状転写体200に形成したトナー像に合致するように重ね合わせて転写器203で転写する。

【0035】更に前記画像形成用プロセスユニット500には黒トナー（BK）が現像装置600に収納されており、前記同様の操作でベルト状転写体200面に黒トナー（BK）像を形成する。

【0036】以上の動作で前記ベルト状転写体200面にカラートナーによるカラー画像が形成され、ベルト状転写体200は回転する懸架部材201, 202で移動してカラー画像が記録紙転写部材104方向に移動する。一方画像形成装置119の下位置には記録紙Pを内蔵した給紙カセットCが設けられており、最上部の記録紙Pを給紙ローラ102により給紙し、記録紙Pは重送防止装置103により確実に一枚の記録紙Pが記録紙案内108に案内搬送される。前記記録紙Pは一旦レジストローラ1031で停止し、ベルト状転写体200面に形成したカラー画像と合致するように給紙を開始し、前記記録紙転写部材104で記録紙Pにカラー画像を転写する。次に記録紙Pは熱定着装置105に搬送され、記録紙Pに前記カラー画像を定着した後、排紙ローラ107で排紙トレイ1191に記録紙PAとして排紙される。

【0037】カラー画像の転写を行った後、ベルト状転写体200面はクリーニング装置701にてクリーニングされ、新たな画像転写が行われる。

【0038】又前記画像形成装置120の一部に開放扉1202が支軸1203で開放可能に設けられており、該開放扉1202を開放する事で、前記イエロートナー（Y）、マゼンタトナー（M）、シアントナー（C）、黒トナー（B

14

K）を収納した画像形成用プロセスユニット500, 501, 502, 503を上部を開放することが可能となる。画像形成用プロセスユニット500, 501, 502, 503を案内保持部材402, 404, 406, 408で案内させて側方に引き出し現像装置600のトナー収納部に簡単にトナー補給を行う事が出来る。更に、前記画像形成用プロセスユニット500, 501, 502, 503を別々に案内保持部材401, 402, 403, 404, 406, 407, 408を介して簡単に着脱する事が可能で、例えば故障時の修理、又は感光体ドラム411の交換及び清掃等を迅速に行う事が出来る。

【0039】一方前記クリーニング装置700, 701より排出される廃棄トナーは、廃棄トナー案内路L1, L2, L3, L4, L5を介して画像形成装置120の下位置に設けた共通の廃棄トナー容器5001に廃棄される図7は本発明の他の実施例で、例えば複写装置の画像形成装置121を示す。図1と同様に、300, 301, 302, 303は半導体レーザー発光体と、ポリゴンミラー及びfθレンズと、反射ミラーを各々内蔵した像露光手段で、イエロー（Y）、マゼンタ（M）、シアン（C）、黒（BK）の現像を行うために、前記像露光手段300, 301, 302, 303を下位置とし、画像形成用プロセスユニット500, 501, 502, 503を上位置となる様に各々対で組み合わせる。そして画像形成用プロセスユニット500, 501, 502, 503を、回転する懸架部材201, 202に対し水平方向に懸架したベルト状転写体200の下側に沿って図示のように並設する。前記画像形成用プロセスユニット500, 501, 502, 503は、画像形成用プロセスユニット500で示すように、感光体ドラム411と、該感光体ドラム411の回転方向に沿って帯電器900、トナー補給部を備えた現像装置600、転写器203、クリーニング装置700が各々設けられており、感光体ドラム411には下位置に設けた像露光手段300より露光され静電潜像が形成される様に構成されている。前記のように構成された像露光手段300, 301, 302, 303と、画像形成用プロセスユニット500, 501, 502, 503を上下一対で配置されるように案内保持部材400, 401, 402, 403, 404, 405, 406, 407に対して図示はしないが例えば突起部材、ピン等で所定位置に案内され、保持固定されている。更に、前記各画像形成用プロセスユニット500, 501, 502, 503内の感光体ドラムをクリーニングした後の廃棄トナーを収容する廃棄トナー容器5001が設けられている。該廃棄トナー容器5001は前記クリーニング装置700より若干下位置で且つ前記各画像形成用プロセスユニット500, 501, 502, 503の側方位置に設けられている。そして前記クリーニング装置700と共に他のクリーニング装置から廃棄トナー案内路L1, L2, L3, L4と、前記ベルト状転写体200に設けたクリーニング装置701よりも廃棄トナー案内路L5が各々設けられ、前記廃棄トナー容器5001に接続している。

【0040】更に本実施例には画像形成装置121の上部に原稿台117を設け、原稿を露光する露光ランプ114と、

(9)

15

ミラーを含めた光学系115と、原稿像を受光するCCD等の受光素子116を各々設けた露光部113が設けられ、前記懸架部材201の軸2011を支軸として画像形成装置121に対しベルト状転写体200と共に開放可能に設けられている。

【0041】前記のように構成した像露光手段300、301、302、303と、画像形成用プロセスユニット500、501、502、503及びベルト状転写体200でカラー画像が形成される。先ず原稿台117上のカラー原稿Dを露光ランプ114で順次露光し、光学系115を介して受光素子116に画像情報を入力し、更に前記画像情報を入力装置111に入力する。又同時にイエロートナー（Y）を現像する画像形成用プロセスユニット500内の感光体ドラム411面に帯電器900で電荷を付与し、次に前記の画像情報を受ける前記入力装置111の画像信号で制御されている像露光手段300で、感光体ドラム411面に静電潜像を形成し、現像装置600でイエロートナー（Y）の現像を開始する。同時に前記ベルト状転写体200も矢印方向に移動を開始し、前記感光体ドラム411面に形成されたイエロートナー

（Y）像を前記ベルト状転写体200に転写器203を用いて転写する。次に前記同様の操作で画像情報によりマゼンタトナー（M）を有する画像形成用プロセスユニット501の感光体ドラム411に形成したマゼンタトナー（M）像を、前記ベルト状転写体200に形成したイエロートナー（Y）像に合致するように重ね合わせて転写器203で転写し、更に次に前記同様の操作で画像情報によりシアントナー（C）を有する画像形成用プロセスユニット502の感光体ドラム411に形成したシアントナー（C）像を、前記ベルト状転写体200に形成したトナー像に合致するように重ね合わせて転写器203で転写する。更に像形成用プロセスユニット503には黒トナー（BK）が現像装置600に収納されており、前記同様の操作でベルト状転写体200面に黒トナー（BK）像を形成する。

【0042】以上の動作で前記ベルト状転写体200面にカラートナーによるカラー画像が形成され、ベルト状転写体200は回転する懸架部材201、202で記録紙転写部材104方向に移動する。一方画像形成装置121の下位置には記録紙Pを内蔵した給紙カセットCが設けられており、最上部の記録紙Pを給紙する給紙ローラ102により給紙され、記録紙Pは重送防止装置103により確実に一枚の記録紙Pが記録紙案内部108に案内搬送される。前記記録紙は一旦レジストローラ1031で停止し、ベルト状転写体200面に形成したカラー画像と合致するように給紙を開始し、前記記録紙転写部材104で記録紙Pにカラー画像を転写する。次に記録紙Pは熱定着装置105に搬送され、記録紙Pに前記カラー画像を定着した後、搬送ローラ106と、排紙ローラ107で排紙トレイ1091に記録紙PAとして排紙される。

【0043】カラー画像の転写を行った後、ベルト状転写体200面はクリーニング装置701にてクリーニングさ

16

れ、新たな画像転写が行われる。

【0044】図8に示す様に本実施例は露光部113とベルト状転写体200を懸架部材201の軸2011を支軸として図示の様に開放する事が出来る。該軸2011を中心に開放する事で、前記イエロートナー（Y）、マゼンタトナー（M）、シアントナー（C）、黒トナー（BK）を収納した画像形成用プロセスユニット500、501、502、503の上部を開放することが可能となる。画像形成用プロセスユニット500、501、502、503に設けた現像装置600のトナー収納部に設けた蓋800を開放する事で簡単にトナー補給を行う事が出来る。更に前記開放動作で前記画像形成用プロセスユニット500、501、502、503の感光体ドラム411面の一部が外部に露出するため、図7に示した感光体ドラム用カバー4111を、図8に示す様に感光体ドラム411面の露出面迄移動し、外光より保護している。感光体ドラム用カバー4111の移動方法は、前記露光部113とベルト状転写体200の開放動作に連動して作動する連結部材を設けるか、又は手動で行ってもよい。

【0045】本実施例に於いて、前記露光部113とベルト状転写体200を同時に開放する構成を示したが、例えばプリンタの場合は、原稿Dを露光する露光部113を設ける必要がなく、従って懸架部材201の軸2011を支軸としてベルト状転写体200のみを開放すればよい。

【0046】その際、前記画像形成用プロセスユニット500、501、502、503を案内保持部材401、403、404、406上より簡単に着脱する事が可能で、例えば故障時の修理、又は感光体ドラム411の交換及び清掃等を迅速に行う事が出来る。

【0047】一方前記クリーニング装置700、701より排出される廃棄トナーは、廃棄トナー案内路L1、L2、L3、L4、L5を介して共通の廃棄トナー容器5001に廃棄される。

【0048】

【発明の効果】以上の様に本発明は、請求項1に於いて、カラー画像形成用の複数の像露光手段と、帯電器、感光体ドラム、現像装置等を有する複数の画像形成用プロセスユニットをベルト状転写体面に沿って互いに並設することで、前記像露光手段で遮られることなく、現像装置のトナー補給と、画像形成装置より着脱を簡単に行う事ができると共に、イエロー、マゼンタ、シアン、黒用の像露光手段と、画像形成用プロセスユニットを共通の構成とする事が出来るので、組み立ての効率化と製造原価を安価にする事が出来る。

【0049】請求項2に於いて、本発明の構成を複写装置に実施した時、上部に設けた原稿露光手段を外部に移動する事で、前記複数の画像形成用プロセスユニットを、ベルト状転写体面に沿って互いに並設されているため、前記像露光手段で遮られることなく簡単にトナー補給と、画像形成装置より着脱する事が出来る。

【0050】請求項3に於いて、前記ベルト状転写体を

(10)

17

水平方向に設置し、前記複数の像露光手段と、複数の画像形成用プロセスユニットを、前記水平方向のベルト状像担持体面に沿って互いに並設する事で、前記像露光手段で遮られることなく簡単にトナー補給と、画像形成装置より着脱する事が出来る。

【0051】請求項4及び5に於いて、前記ベルト状転写体を略縦位置か傾斜して配置し、前記前記複数の像露光手段と、複数の画像形成用プロセスユニットを、前記傾斜したベルト状転写体面に沿って交互に傾斜並設する事で、複数の画像形成用プロセスユニットを、前記像露光手段で遮られることなく簡単に画像形成装置より着脱する事が出来る。

【0052】請求項6に於いて、前記複数の画像形成用プロセスユニットに設けた感光体ドラムのクリーニング装置と、ベルト状転写体のクリーニング装置により各々クリーニングされた廃棄トナーを、共通の回収手段で回収出来るため、画像形成装置のメンテナンスが容易となる。

【0053】請求項7に於いて、前記ベルト状転写体の下位置に複数の像露光手段と、複数の画像形成用プロセスユニットを設け、前記ベルト状転写体を開放する事で前記像露光手段で遮られることなく簡単にトナー補給と、画像形成装置より着脱する事が出来る。

【0054】請求項8に於いて、前記ベルト状転写体の下位置に複数の像露光手段と、複数の画像形成用プロセスユニットを設け、前記ベルト状転写体と複写装置に実施した時、上部に設けた原稿露光手段を外部に移動する事で、画像形成用プロセスユニットを開放し、前記像露光手段で遮られることなく簡単にトナー補給と、画像形成装置より着脱する事が出来る。

18

【図面の簡単な説明】

【図1】本発明のプリンタに用いた画像形成装置の全体構成図。

【図2】本発明の複写装置に用いた画像形成装置の全体構成図。

【図3】本発明の像露光手段と、画像形成用プロセスユニットの一例を示す構成図。

【図4】本発明の他の実施例でプリンタに用いた画像形成装置の全体構成図。

【図5】本発明の他の実施例でプリンタに用いた画像形成装置の全体構成図。

【図6】本発明の他の実施例でプリンタに用いた画像形成装置の全体構成図。

【図7】本発明の他の複写装置に用いた画像形成装置の全体構成図。

【図8】図7に於けるベルト状転写体と露光部を移動させた画像形成装置の全体構成図。

【符号の説明】

100, 112, 118, 119, 120, 121 画像形成装置

104 記録紙転写部材

200 ベルト状転写体

203 転写器

300, 301, 302, 303 像露光装置

411 感光体ドラム

500, 501, 502, 503 画像形成用プロセスユニット

600 現像装置

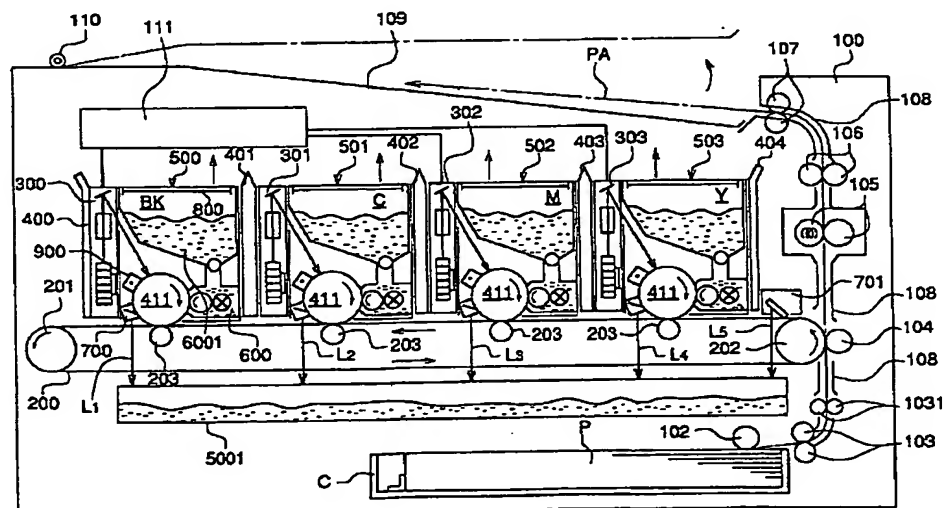
700, 701 クリーニング装置

800 蓋

900 帯電器

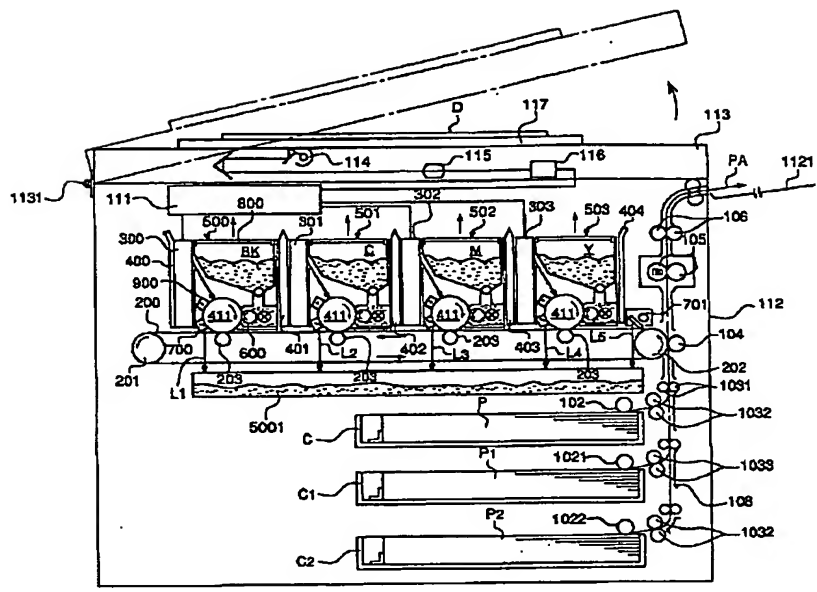
30 5001 廃棄トナー容器

【図1】

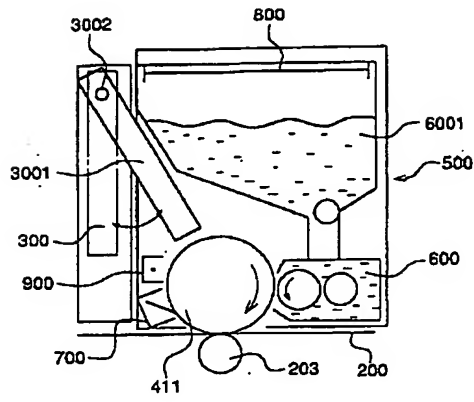


(11)

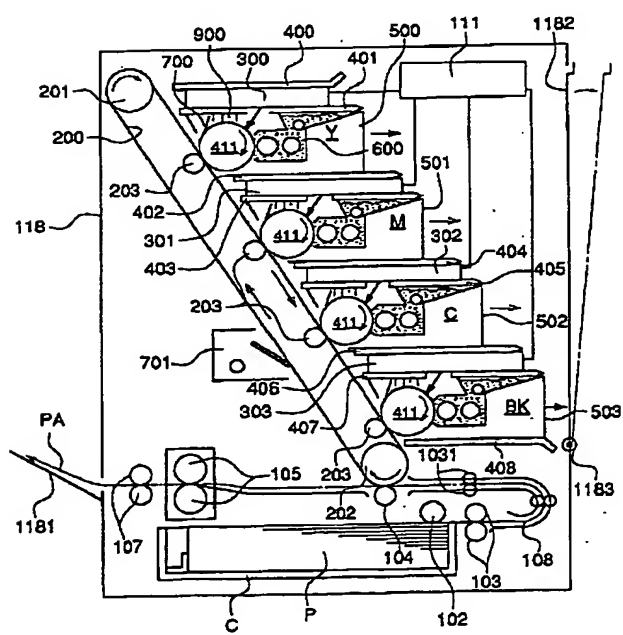
【図2】



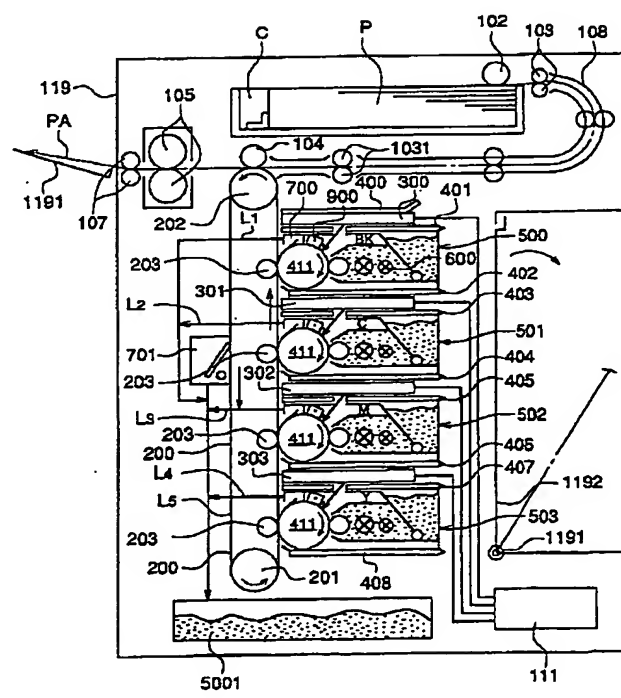
【図3】



【図4】

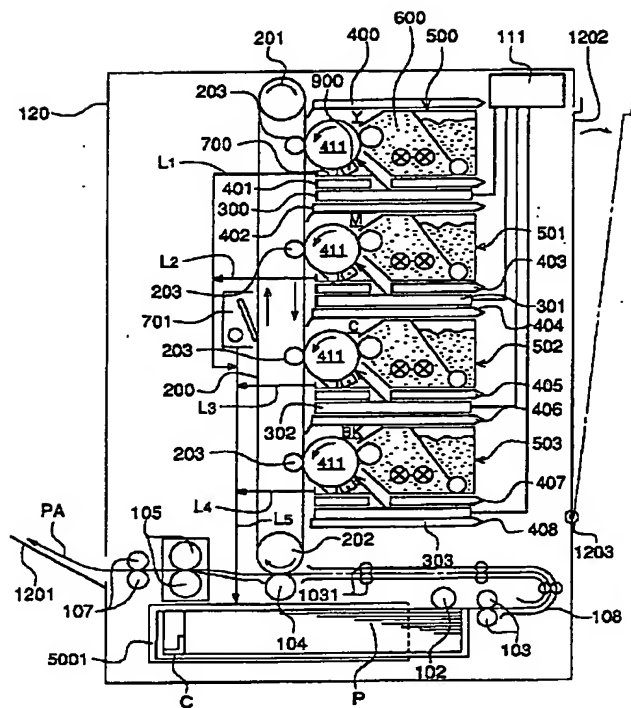


【図5】

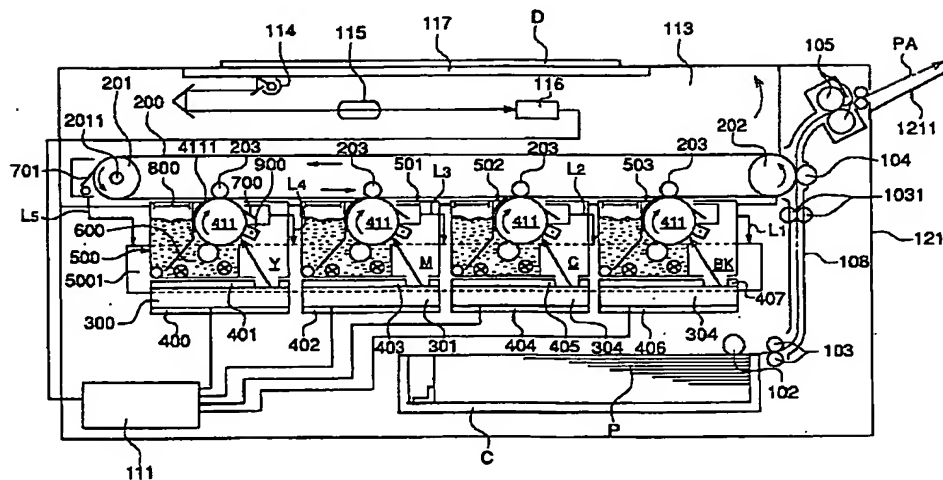


(12)

【図6】

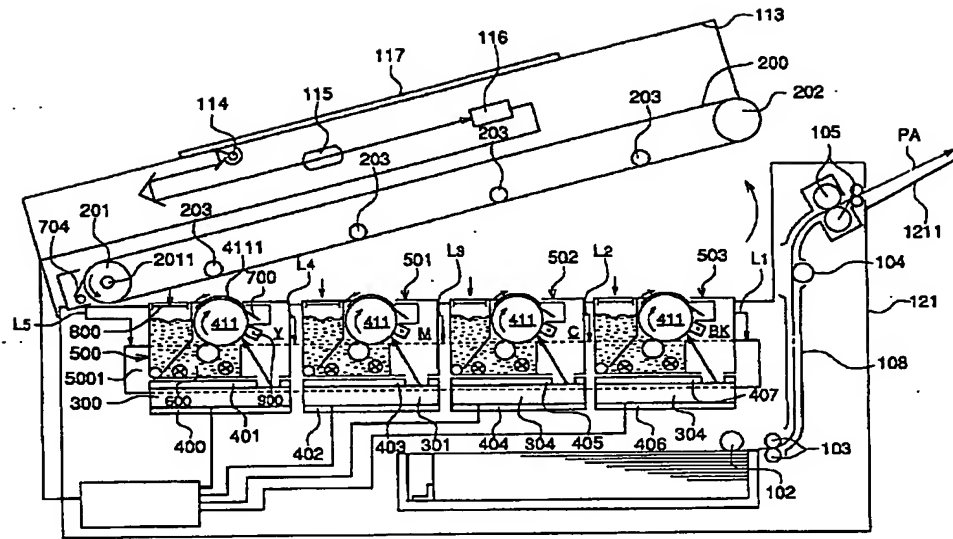


【図7】



(13)

【図8】



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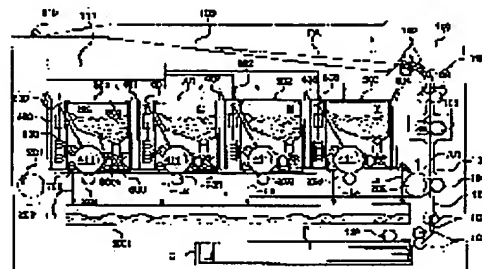
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(54) IMAGE FORMING DEVICE

(57)Abstract:

PURPOSE: To facilitate the exchange of image forming process units and the supply of toner by attaching/detaching plural image forming process units in the direction away from a transfer body, with respect to a belt-like formed transfer body.

CONSTITUTION: Plural image exposing devices 300-303 and image forming process units 500-503 which are alternately provided in parallel, toner images formed on a photoreceptor drum 411 by the plural image exposing devices 300-303 and the image forming process units 500-503 respectively are successively superimposed on the belt-like formed transfer body 200, to form an image and then, it is transferred to a recording medium P. When the plural image forming process units 500-503 are attached to/detached from an image forming device 100, the plural process units 500-503 are provided to attach/detach in the direction away from the transfer body P, with respect to the belt-like formed transfer body 200. Therefore, the supply of the toner of a developing device 600 and the attachment to/detachment from the image forming device 100 is easily attained.



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CLAIMS

[Claim(s)]

[Claim 1] It has two or more image exposure means, this image exposure means, and two or more process units for image formation installed by turns. Two or more image exposure means, The toner image respectively formed in said image support by the image formation process unit In the image formation equipment which lays on top of the imprint object formed in the shape of a belt one by one, and is imprinted on the recording paper after forming an image Image formation equipment characterized by preparing so that it may detach and attach in the direction which estranges said two or more image formation process units from image formation equipment to said imprint object to the imprint object formed in the shape of [said] a belt when detaching and attaching said two or more process units for image formation.

[Claim 2] Image formation equipment according to claim 1 characterized by preparing so that said two or more image exposure means and the upper part of two or more image formation process units may be opened wide and these two or more image formation process units may be estranged to said imprint object by having made more movable than said image formation location the manuscript reader formed in said image formation equipment.

[Claim 3] Image formation equipment according to claim 1 which stretches horizontally the imprint object formed in the shape of [said] a belt by the suspension member, and is characterized by preparing said two or more image exposure means and two or more image formation process units in accordance with said imprint object.

[Claim 4] Image formation equipment according to claim 1 characterized by two or more image exposure means arranged in the lengthwise direction in accordance with the imprint object formed in the shape of [which was stretched to the abbreviation lengthwise direction / said] a belt, and said imprint object by said suspension member, and consisting of two or more image formation process units.

[Claim 5] Image formation equipment according to claim 1 characterized by two or more image exposure means by which inclination arrangement was carried out in accordance with the imprint object formed in the shape of [which was inclined and stretched by said suspension member / said] a belt, and said imprint object, and consisting of two or more image formation process units.

[Claim 6] It has two or more process units for image formation which installed two or more image exposure means and this image exposure means by turns. Two or more image exposure means, The toner image respectively formed in said image support by the image formation process unit A cleaning means to clean the image support of two or more of said process units for image formation in the image formation equipment which lays on top of the imprint object formed in the shape of a belt one by one, and is imprinted on the recording paper after forming an image, Image formation equipment characterized by having a cleaning means to clean said imprint object formed in the shape of a belt, and a common recovery means to collect the toners cleaned by said cleaning means after imprinting said toner image.

[Claim 7] It has two or more image exposure means, this image exposure means, and the process unit for image formation installed by turns. Two or more image exposure means, The toner image respectively formed in said image support by said process unit for image formation While arranging in the image formation equipment which lays on top of the imprint object formed in the shape of a belt one by one, and is imprinted on the recording paper after forming an image in the bottom location of the imprint object which formed said two or more process units for image formation in the shape of [said] a belt Image formation equipment characterized by having made more movable than an image formation location the imprint object formed in the shape of

[which carried out suspension by the suspension member / said] a belt, and making removable said two or more process units for image formation at least than image formation equipment.

[Claim 8] Image formation equipment according to claim 7 characterized by having made said imprint object movable with the manuscript reader formed in image formation equipment, and making removable said two or more process units for image formation at least than image formation equipment.

[Claim 9] Said two or more process units for image formation are image formation equipment given in any 1 term of claims 1-8 characterized by being a process unit for color picture formation.

[Claim 10] Said two or more image exposure means and two or more image formation process units are image formation equipment given in any 1 term of claims 1-8 characterized by being respectively held in the predetermined location by the guidance maintenance means formed in image formation equipment.

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] In image-formation equipment, this invention is said image aligner and image-formation equipment which imprints the image formed in said image support of the process unit for image formation on an imprint object, and imprints said image on the recording paper from this imprint object further while forming an image in image support by the image aligner and the process unit for image formation, and it relates to the image-formation equipment improved in order to make the process unit for image formation detach and attach simply from said imprint object.

[0002]

[Description of the Prior Art] It is respectively arranged in order of an electrification machine, the aligner for latent-image formation, a developer, an imprint machine, and cleaning equipment to the image support which has the shape of a photo conductor of the shape of a belt by which suspension was carried out to the rotatable suspension member focusing on two or more image support (henceforth a photo conductor drum). And the configuration which each part material arranged centering on said photo conductor drum puts a development counter in order, and is arranged is known for JP,3-77940,U, JP,3-77941,U, etc. With said configuration, generally it is used for color picture formation, an electrification machine, and a developer and cleaning equipment were constituted from one image formation process unit to said photo conductor drum, and, in the case of the printer, the aligner for latent-image formation which contained the polygon mirror, ftheta lens, the reflective mirror, etc. by making a semiconductor laser emitter into the light source is separately formed in the up location corresponding to the process unit for image formation which has this each color toner. Furthermore, in the case of the reproducing unit, the manuscript reader is arranged in the upper part of said aligner for latent-image formation.

[0003]

[Problem(s) to be Solved by the Invention] When supplying a toner to the developer in each process unit for image formation, the image formation equipment constituted as mentioned above must move to the side the image aligner for latent-image formation formed in the upper part of the process unit for image formation from an up location, and must open the opening of the toner of said developer. Moreover, also when detaching and attaching the process unit for image formation from the body of image formation equipment by exchange of a photo conductor drum etc., it is necessary to move the image aligner for said latent-image formation to said this appearance, or to remove. Then, when exposing a photo conductor drum with the image aligner for said latent-image formation, in order to make image formation of an image formation side exact, it is constituted so that strict alignment can be performed. If the image aligner for said latent-image formation is moved from image formation equipment as mentioned above or it is removing, an error will arise in alignment, the focus of an image goes wrong, and it becomes impossible however, to form an exact image. Furthermore, doing the activity which moves said said aligner for latent-image formation at the time of the above toner supply of a developer and exchange of a photo conductor drum, or is removed must carry out long duration interruption of record or the copy activity, and it reduces the effectiveness of record or a copy activity remarkably.

[0004] This invention is considered especially in order to improve the aforementioned fault. That is, they are also the purpose and the bottom about making easy exchange of the process unit for image formation which built exchange of each image aligner, a photo conductor drum, a developer, etc. in the image support which formed respectively the process unit for image formation which built in the image aligner for latent-image

formation, a photo conductor drum, a developer, etc. in the shape of a belt by carrying out side-by-side installation arrangement, and supply of a toner.

[0005]

[Means for Solving the Problem] In claim 1, it has two or more image exposure means, this image exposure means, and two or more process units for image formation installed by turns for said purpose. Two or more image exposure means, The toner image respectively formed in said image support by the image formation process unit In the image formation equipment which lays on top of the imprint object formed in the shape of a belt one by one, and is imprinted on the recording paper after forming an image It prepared so that it might detach and attach in the direction which estranges said two or more image formation process units from image formation equipment to said imprint object to the imprint object formed in the shape of [said] a belt when detaching and attaching said two or more process units for image formation. It prepared so that said two or more image exposure means and the upper part of two or more image formation process units might be opened wide and these two or more image formation process units might be estranged to said imprint object by having made the manuscript reader formed in said image formation equipment more movable than said image formation location in claim 2. In claim 3, the imprint object formed in the shape of [said] a belt was horizontally stretched by the suspension member, and said two or more image exposure means and two or more image formation process units were prepared in accordance with said imprint object. Become the imprint object formed in the shape of [which was stretched to the abbreviation lengthwise direction by said suspension member / said] a belt, and two or more image exposure means arranged in accordance with said imprint object in the lengthwise direction from two or more image formation process units in claim 4. Become the imprint object formed in the shape of [which was inclined and stretched by said suspension member / said] a belt, and two or more image exposure means by which inclination arrangement was carried out in accordance with said imprint object from two or more image formation process units in claim 5. In claim 6, it has two or more process units for image formation which installed two or more image exposure means and this image exposure means by turns. Two or more image exposure means, The toner image respectively formed in said image support by the image formation process unit A cleaning means to clean the image support of two or more of said process units for image formation in the image formation equipment which lays on top of the imprint object formed in the shape of a belt one by one, and is imprinted on the recording paper after forming an image, Have a cleaning means to clean said imprint object formed in the shape of a belt, and a common recovery means to collect the toners cleaned by said cleaning means after imprinting said toner image. In claim 7, it has two or more image exposure means, this image exposure means, and the process unit for image formation installed by turns. Two or more image exposure means, The toner image respectively formed in said image support by said process unit for image formation While arranging in the image formation equipment which lays on top of the imprint object formed in the shape of a belt one by one, and is imprinted on the recording paper after forming an image in the bottom location of the imprint object which formed said two or more process units for image formation in the shape of [said] a belt The imprint object formed in the shape of [which carried out suspension by the suspension member / said] a belt was made more movable than an image formation location, and said two or more process units for image formation were made removable at least than image formation equipment. In claim 8, said imprint object was made movable with the manuscript reader formed in image formation equipment, and said two or more process units for image formation were made removable at least than image formation equipment. In claim 9, said two or more process units for image formation should be process units for color picture formation. In claim 10, said two or more image exposure means and two or more image formation process units are attained by being respectively held in the predetermined location by the guidance maintenance means formed in image formation equipment.

[0006]

[Example] The example of this invention is explained using drawing with the operation.

[0007] Drawing 1 is one example of this invention, for example, shows the image formation equipment 100 of a color printer. In order for 300,301,302,303 to be a semiconductor laser emitter, a polygon mirror and ftheta lens, and the image exposure means that built in the reflective mirror respectively and to perform development for yellow (Y), a Magenta (M), cyanogen (C), and black (BK) in drawing, the process unit 500,501,502,503 for image formation is formed so that it may install with said image exposure means 300,301,302,303. And in accordance with the belt-like imprint object 200 which carried out the suspension of the process unit

500,501,502,503 for image formation to said image exposure means 300,301,302,303 horizontally to the suspension member 201,202 to rotate, it installs by turns like illustration and prepares. The electrification machine 900, the developer 600 equipped with the toner supply section, the imprint machine 203, and cleaning equipment 700 are respectively formed along the hand of cut of the photo conductor drum 411 and this photo conductor drum 411, and said process unit 500,501,502,503 for image formation is constituted by the appearance in which it is installed by the photo conductor drum 411, and is exposed from the image exposure means 300, and an electrostatic latent image is formed, as the process unit 500 for image formation shows. Although said image exposure means 300,301,302,303 constituted as mentioned above and the process unit 500,501,502,503 for image formation do not carry out illustration by the guidance attachment components 400 and 401,402,403,404, by the projection member, the pin, etc., it shows around in a predetermined location and maintenance immobilization of them is carried out. Furthermore, the abandonment toner bottle 5001 which holds the abandonment toner after cleaning the photo conductor drum in said each process unit 500,501,502,503 for image formation is formed. The abandonment toner guidance way L5 was respectively formed from other cleaning equipments with said cleaning equipment 700 rather than the abandonment toner guidance ways L1, L2, L3, and L4 and the cleaning equipment 701 formed in said belt-like imprint object 200, and it has connected with said abandonment toner bottle 5001.

[0008] A color picture is formed with the image exposure means 300,301,302,303 constituted as mentioned above, and the process unit 500,501,502,503 for image formation and the belt-like imprint object 200. The electrification machine 900 gives a charge to the 411st page of the photo conductor drum in the process unit 503 for image formation which develops a yellow toner (Y) first, an electrostatic latent image is formed in the 411st page of a photo conductor drum with the image exposure means 303 controlled by the picture signal of the input unit 111 which receives an external picture signal next, and the development of a yellow toner (Y) is started with a developer 600. Said belt-like imprint object 200 also starts migration in the direction of an arrow head to coincidence, on said belt-like imprint object 200, the imprint machine 203 is used and the yellow toner (Y) image formed in the 411st page of said photo conductor drum is imprinted. Next, the Magenta toner (M) image formed in the photo conductor drum 411 of the process unit 502 for image formation which has a Magenta toner (M) by image information by said same actuation It imprints by heavy doubling ***** 203 so that it may agree in the yellow toner (Y) image formed in said belt-like imprint object 200. Furthermore, the cyanogen toner (C) image formed in the photo conductor drum 411 of the process unit 501 for image formation which has a cyanogen toner (C) by image information by said same actuation next It imprints by heavy doubling ***** 203 so that it may agree in the Magenta toner image formed in said belt-like imprint object 200. Furthermore, the black toner (BK) is contained by the developer 600 and said process unit 500 for image formation forms a black toner (BK) image in the 200th page of a belt-like imprint object by said same actuation.

[0009] The color picture by the color toner is formed in the 200th page of said belt-like imprint object in the above actuation, and the belt-like imprint object 200 carries out reversal actuation by the suspension member 201,202 to rotate, and moves in the recording paper imprint member 104 direction. On the other hand, sheet paper cassette C which built in the recording paper P is prepared in the bottom location of said abandonment toner bottle 5001, paper is fed with the feed roller 102 which feeds paper to the topmost recording paper P, and, as for the recording paper P, guidance conveyance of one sheet of recording paper P is certainly carried out inside [108] a recording paper proposal by double-feed-prevention equipment 103. Said detail paper P once stops with the resist roller 1031, it starts feeding so that it may agree with the color picture formed in the 200th page of a belt-like imprint object, and it imprints a color picture on the detail paper P by said detail-paper imprint member 104.

[0010] Next, after the recording paper P is conveyed by the heat anchorage device 105 and fixed to the recording paper P in said color picture, it is delivered to a paper output tray 109 as the recording paper PA with the conveyance roller 106 and the delivery roller 107.

[0011] After imprinting a color picture, the 200th page of a belt-like imprint object is cleaned with cleaning equipment 701, and a new image imprint is performed.

[0012] Moreover, said paper output tray 109 is formed possible [disconnection] by the pivot 110 prepared in some image formation equipments 100, and it is opening this paper output tray 109, and it becomes possible to open the upper part of the process unit 500,501,502,503 for image formation which contained said yellow toner

(Y), the Magenta toner (M), the cyanogen toner (C), and the black toner (BK). Toner supply can be easily performed by opening the lid 800 formed in the toner compartment of the developer 600 formed in the process unit 500,501,502,503 for image formation. Furthermore, it is possible to detach and attach said process unit 500,501,502,503 for image formation simply through the guidance attachment component 401,402,403,404, for example, repair at the time of failure or exchange of the photo conductor drum 411, cleaning, etc. can be performed quickly.

[0013] The abandonment toner discharged from said cleaning equipment 700,701 on the other hand is discarded by the common abandonment toner bottle 5001 through the abandonment toner guidance ways L1, L2, L3, L4, and L5.

[0014] Drawing 2 is one example of this invention, for example, shows the image formation equipment 112 of a reproducing unit. Like drawing 1, 300,301,302,303 is a semiconductor laser emitter, a polygon mirror and ftheta lens, and the image exposure means that built in the reflective mirror respectively, and in order to perform development of yellow (Y), a Magenta (M), cyanogen (C), and black (BK), the process unit 500,501,502,503 for image formation is formed so that it may install with said image exposure means 300,301,302,303. And in accordance with the belt-like imprint object 200 which carried out the suspension of the process unit 500,501,502,503 for image formation to said image exposure means 300,301,302,303 horizontally to the suspension member 201,202 to rotate, it installs by turns like illustration and prepares. The electrification machine 900, the developer 600 equipped with the toner supply section, the imprint machine 203, and cleaning equipment 700 are respectively formed along the hand of cut of the photo conductor drum 411 and this photo conductor drum 411, and said process unit 500,501,502,503 for image formation is constituted by the appearance in which it is installed by the photo conductor drum 411, and is exposed from the image exposure means 300, and an electrostatic latent image is formed, as the process unit 500 for image formation shows. Although the image exposure means 300,301,302,303 constituted as mentioned above and the process unit 500,501,502,503 for image formation do not carry out illustration by the guidance attachment components 400 and 401,402,403,404, by the projection member, the pin, etc., it shows around in a predetermined location and maintenance immobilization of them is carried out. Furthermore, the abandonment toner bottle 5001 which holds the abandonment toner after cleaning the photo conductor drum in said each process unit 500,501,502,503 for image formation is formed. The abandonment toner guidance way L5 was respectively formed from other cleaning equipments with said cleaning equipment 700 rather than the abandonment toner guidance ways L1, L2, L3, and L4 and the cleaning equipment 701 formed in said belt-like imprint object 200, and it has connected with said abandonment toner bottle 5001.

[0015] Furthermore, the exposure section 113 which established the manuscript base 117 in the upper part of image formation equipment 112 at this example, and formed respectively the photo detectors 116, such as the exposure lamp 114 which exposes a manuscript, the optical system 115 including a mirror, and CCD which receives a manuscript image, prepares, is carried out, and is prepared possible [disconnection] by the pivot 1131 by the end of image formation equipment 112.

[0016] A color picture is formed with the image exposure means 300,301,302,303 constituted as mentioned above, and the process unit 500,501,502,503 for image formation and the belt-like imprint object 200. Sequential exposure of the color copy D on the manuscript base 117 is first carried out with the exposure lamp 114, image information is inputted into a photo detector 116 through optical system 115, and said image information is further inputted into an input unit 111. Moreover, the electrification machine 900 gives a charge to the 411st page of the photo conductor drum in the process unit 503 for image formation which develops a yellow toner (Y) to coincidence, an electrostatic latent image is formed in the 411st page of a photo conductor drum with the image exposure means 303 currently controlled by the picture signal of said input unit 111 which receives the aforementioned image information next, and the development of a yellow toner (Y) is started with a developer 600. Said belt-like imprint object 200 also starts migration in the direction of an arrow head to coincidence, on said belt-like imprint object 200, the imprint machine 203 is used and the yellow toner (Y) image formed in the 411st page of said photo conductor drum is imprinted. Next, the Magenta toner (M) image formed in the photo conductor drum 411 of the process unit 502 for image formation which has a Magenta toner (M) by image information by said same actuation It imprints by heavy doubling ***** 203 so that it may agree in the yellow toner (Y) image formed in said belt-like imprint object 200. Furthermore, the cyanogen toner (C) image formed in the photo conductor drum 411 of the process unit 501,500 for image formation which

has a cyanogen toner (C) and a black toner (BK) by image information by said same actuation next, A black toner (BK) image is imprinted by heavy doubling ***** 203 so that it may agree in the toner image formed in said belt-like imprint object 200. In addition, it is cleaned with the photo conductor drum 411 and the sequential cleaning equipment 700 which ended the imprint of an image on said belt-like imprint object 200. [0017] The color picture by the color toner is formed in the 200th page of said belt-like imprint object in the above actuation, and the belt-like imprint object 200 carries out reversal actuation by the suspension member 201,202 to rotate, and moves in the recording paper imprint member 104 direction. On the other hand, the sheet paper cassettes C, C1, and C2 which built in the recording papers P, P1, and P2 are formed in the bottom location of said abandonment toner bottle 5001. Paper is fed with the feed rollers 102, 1021, and 1022 which feed paper to the topmost recording papers P, P1, and P2 according to the size of Manuscript D, and the size of hope. As for the recording paper P, guidance conveyance of one sheet of recording paper P is certainly carried out inside [108] a recording paper proposal by the double-feed-prevention equipments 1032, 1033, and 1034. Said detail paper once stops with the resist roller 1031, it starts feeding so that it may agree with the color picture formed in the 200th page of a belt-like imprint object, and it imprints a color picture on the detail paper P by said detail-paper imprint member 104. Next, after the recording paper P is conveyed by the heat anchorage device 105 and fixed to the recording paper P in said color picture, it is delivered to a paper output tray 1091 as the recording paper PA with the conveyance roller 106 and the delivery roller 107.

[0018] After imprinting a color picture, the 200th page of a belt-like imprint object is cleaned with cleaning equipment 701, and a new image imprint is performed.

[0019] This example is opening the exposure section 113 focusing on a pivot 1131, and it becomes possible to open the upper part of the process unit 500,501,502,503 for image formation which contained said yellow toner (Y), the Magenta toner (M), the cyanogen toner (C), and the black toner (BK). Toner supply can be easily performed by opening the lid 800 formed in the toner compartment of the developer 600 formed in the process unit 500,501,502,503 for image formation. furthermore -- ** -- it is possible to detach and attach said process unit 500,501,502,503 for image formation simply through the guidance attachment component 401,402,403,404, for example, repair at the time of failure or exchange of the photo conductor drum 411, cleaning, etc. can be performed quickly.

[0020] The abandonment toner discharged from said cleaning equipment 700,701 on the other hand is discarded by the common abandonment toner bottle 5001 through the abandonment toner guidance ways L1, L2, L3, L4, and L5.

[0021] Drawing 3 is contained in the location of an alternate long and short dash line, when detaching and attaching image exposure means 300 body which formed [it is what formed the LED emitter 3001 as an image exposure means 300, and the end of the LED emitter 3001 was prepared free / rotation / with the shaft 3002 to image exposure means 300 body, and fixed / towards the 411st page of a photo conductor drum / at the time of use like illustration] the process unit 500 for image formation, or the LED emitter 3001 to image-formation equipment 100.

[0022] Drawing 4 is other one example of this invention, for example, shows the image formation equipment 118 of a color printer. Especially this invention inclines by turns like illustration in accordance with the belt-like imprint object 200 which inclined and carried out the suspension of the process unit 500,501,502,503 for image formation to the image exposure means 300,301,302,303 to the suspension member 201,202 to rotate, and is installed in the lengthwise direction side by side in piles. Like drawing 1 , 300,301,302,303 is a semiconductor laser emitter, a polygon mirror and ftheta lens, and the image exposure means that built in the reflective mirror respectively, and in order to perform development for yellow (Y), a Magenta (M), cyanogen (C), and black (BK), the process unit 500,501,502,503 for image formation is formed so that it may incline with said image exposure means 300,301,302,303 and may install. The electrification machine 900, the developer 600 equipped with the toner supply section, the imprint machine 203, and cleaning equipment 700 are respectively formed along the hand of cut of the photo conductor drum 411 and this photo conductor drum 411, and said process unit 500,501,502,503 for image formation is constituted by the appearance in which the photo conductor drum 411 is exposed from the image exposure means 300 formed in the upper location, and an electrostatic latent image is formed, as the process unit 500 for image formation shows. Although said image exposure means 300,301,302,303 constituted as mentioned above and the process unit 500,501,502,503 for image formation do not carry out illustration by the guidance attachment components 400, 401, 402, 403, 404, and 405,406,407,408,

by the projection member, the pin, etc., it shows around in a predetermined location, and it lays and maintenance immobilization of them is carried out.

[0023] A color picture is formed with the image exposure means 300,301,302,303 constituted as mentioned above, and the process unit 500,501,502,503 for image formation and the belt-like imprint object 200 which carried out inclination arrangement. The electrification machine 900 gives a charge to the 411st page of the photo conductor drum in the process unit 500 for image formation which develops a yellow toner (Y) first, an electrostatic latent image is formed in the 411st page of a photo conductor drum with the image exposure means 300 controlled by the picture signal of the input unit 111 which receives an external picture signal next, and the development of a yellow toner (Y) is started with a developer 600. Said belt-like imprint object 200 also starts migration in the direction of an arrow head to coincidence, on said belt-like imprint object 200, the imprint machine 203 is used and the yellow toner (Y) image formed in the 411st page of said photo conductor drum is imprinted. Next, the Magenta toner (M) image formed in the photo conductor drum 411 of the process unit 501 for image formation which has a Magenta toner (M) by image information by said same actuation It imprints by heavy doubling ***** 203 so that it may agree in the yellow toner (Y) image formed in said belt-like imprint object 200. Furthermore, the cyanogen toner (C) image and black toner (BK) image which were formed in the photo conductor drum 411 of the process unit 501,503 for image formation which has a cyanogen toner (C) and a black toner (BK) by image information by said same actuation next It imprints by heavy doubling ***** 203 so that it may agree in the Magenta toner (M) image formed in said belt-like imprint object 200. Furthermore, the black toner (BK) is contained by the developer 600 and said process unit 503 for image formation forms a black toner (BK) image in the 200th page of a belt-like imprint object by said same actuation.

[0024] The color picture by the color toner is formed in the 200th page of said belt-like imprint object in the above actuation, and the belt-like imprint object 200 moves in the recording paper imprint member 104 direction by the suspension member 201,202 to rotate. On the other hand, sheet paper cassette C which built in the recording paper P is prepared in the bottom location of image formation equipment 118, paper is fed with the feed roller 102 which feeds paper to the topmost recording paper P, and, as for the recording paper P, guidance conveyance of one sheet of recording paper P is certainly carried out inside [108] a recording paper proposal by double-feed-prevention equipment 103. Said detail paper P once stops with the resist roller 1031, it starts feeding so that it may agree with the color picture formed in the 200th page of a belt-like imprint object, and it imprints a color picture on the detail paper P by said detail-paper imprint member 104. Next, after the recording paper P is conveyed by the heat anchorage device 105 and fixed to the recording paper P in said color picture, it is delivered to a paper output tray 1181 as the recording paper PA with the delivery roller 107.

[0025] After imprinting a color picture, the 200th page of a belt-like imprint object is cleaned with cleaning equipment 701, it is reversed, and a new image imprint is performed.

[0026] Moreover, the open door 1182 is formed possible [disconnection] by the pivot 1183 in some image formation equipments 118, and it becomes possible to open the side of the process unit 500,501,502,503 for image formation which contained said yellow toner (Y), the Magenta toner (M), the cyanogen toner (C), and the black toner (BK). It is possible to supply said toner to the process unit 500,501,502,503 for image formation by which inclination arrangement was carried out in the arranged location. Furthermore, a toner compartment can be wide opened by pulling out a developer 600 and said process unit 500,501,502,503 for image formation along with said guidance attachment component 402,404,406,408, and toner supply can be performed easily. Furthermore, it is possible to guide said process unit 500,501,502,503 for image formation by the guidance attachment components 401, 402, 403, 404, and 405,406,407,408, and to detach and attach it simply, for example, repair at the time of failure or exchange of the photo conductor drum 411, cleaning, etc. can be performed quickly.

[0027] Moreover, this example carried out inclination arrangement of the belt-like imprint object 200, and since it had arranged cleaning equipment 701 using this inclination, it has improved the cleaning engine performance sharply.

[0028] Drawing 5 is other one example of this invention, for example, shows the image formation equipment 119 of a color printer. In order for 300,301,302,303 to be a semiconductor laser emitter, a polygon mirror and theta lens, and the image exposure means that built in the reflective mirror respectively and to perform development for yellow (Y), a Magenta (M), cyanogen (C), and black (BK) in drawing, the process unit

500,501,502,503 for image formation is formed in said image exposure means 300,301,302,303 and lengthwise direction. And it is prepared in the lengthwise direction by turns to said image exposure means 300,301,302,303 and the suspension member 201,202 turning around the process unit 500,501,502,503 for image formation in the condition of having put in accordance with the belt-like imprint object 200 which carried out suspension. The electrification machine 900, the developer 600 equipped with the toner supply section, the imprint machine 203, and cleaning equipment 700 are respectively formed along the hand of cut of the photo conductor drum 411 and this photo conductor drum 411, and said process unit 500,501,502,503 for image formation is constituted by the appearance in which the photo conductor drum 411 is exposed from the image exposure means 300 formed in the upper part, and an electrostatic latent image is formed, as the process unit 500 for image formation shows like drawing 1 . Although said image exposure means 300,301,302,303 constituted as mentioned above and the process unit 500,501,502,503 for image formation do not carry out illustration by the guidance attachment components 400, 401, 402, 403, 404, and 405,406,407,408, by the projection member, the pin, etc., it shows around in a predetermined location and maintenance immobilization of them is carried out. Furthermore, the abandonment toner bottle 5001 which holds the abandonment toner after cleaning the photo conductor drum in said each process unit 500,501,502,503 for image formation is formed in the bottom location of image formation equipment 119. The abandonment toner guidance way L5 was respectively formed from other cleaning equipments with said cleaning equipment 700 rather than the abandonment toner guidance ways L1, L2, L3, and L4 and the cleaning equipment 701 formed in said belt-like imprint object 200, and it has connected with said abandonment toner bottle 5001.

[0029] A color picture is formed with the image exposure means 300,301,302,303 constituted as mentioned above, and the process unit 500,501,502,503 for image formation and the belt-like imprint object 200. The electrification machine 900 gives a charge to the 411st page of the photo conductor drum in the process unit 503 for image formation which develops a yellow toner (Y) first, an electrostatic latent image is formed in the 411st page of a photo conductor drum with the image exposure means 303 controlled by the picture signal of the input unit 111 which receives an external picture signal next, and the development of a yellow toner (Y) is started with a developer 600. Said belt-like imprint object 200 also starts migration in the direction of an arrow head to coincidence, on said belt-like imprint object 200, the imprint machine 203 is used and the yellow toner (Y) image formed in the 411st page of said photo conductor drum is imprinted. Next, the Magenta toner (M) image formed in the photo conductor drum 411 of the process unit 502 for image formation which has a Magenta toner (M) by image information by said same actuation It imprints by heavy doubling ***** 203 so that it may agree in the yellow toner (Y) image formed in said belt-like imprint object 200. Furthermore, the cyanogen toner (C) image formed in the photo conductor drum 411 of the process unit 501 for image formation which has a cyanogen toner (C) by image information by said same actuation next It imprints by heavy doubling ***** 203 so that it may agree in the Magenta toner (M) image formed in said belt-like imprint object 200. Furthermore, the black toner (BK) is contained by the developer 600 at said process unit 500 for image formation, and a black toner (BK) image is formed in the 200th page of a belt-like imprint object by said same actuation.

[0030] The color picture by the color toner is formed in the 200th page of said belt-like imprint object in the above actuation, the belt-like imprint object 200 moves by the suspension member 201,202 to rotate, and a color picture moves it in the recording paper imprint member 104 direction. On the other hand, sheet paper cassette C which built in the recording paper P is prepared in the upper location of image formation equipment 119, paper is fed to the topmost recording paper P with the feed roller 102, and, as for the recording paper P, guidance conveyance of one sheet of recording paper P is certainly carried out inside [108] a recording paper proposal by double-feed-prevention equipment 103. Said detail paper P once stops with the resist roller 1031, it starts feeding so that it may agree with the color picture formed in the 200th page of a belt-like imprint object, and it imprints a color picture on the detail paper P by said detail-paper imprint member 104. Next, after the recording paper P is conveyed by the heat anchorage device 105 and fixed to the recording paper P in said color picture, it is delivered to a paper output tray 1191 as the recording paper PA with the delivery roller 107.

[0031] After imprinting a color picture, the 200th page of a belt-like imprint object is cleaned with cleaning equipment 701, and a new image imprint is performed.

[0032] Moreover, the open door 1192 is formed possible [disconnection] by the pivot 1191 in said some of image formation equipments 119, and it becomes possible by opening this open door 1192 to open the upper

part about the process unit 500,501,502,503 for image formation which contained said yellow toner (Y), the Magenta toner (M), the cyanogen toner (C), and the black toner (BK). The process unit 500,501,502,503 for image formation can be made to be able to show around by the guidance attachment component 402,404,406,408, it can pull out to the side, and toner supply can be performed easily [the toner compartment of a developer 600]. Furthermore, it is possible to detach and attach said process unit 500,501,502,503 for image formation simply through the guidance attachment components 401, 402, 403, and 404,406,407,408 separately, for example, repair at the time of failure or exchange of the photo conductor drum 411, cleaning, etc. can be performed quickly.

[0033] Drawing 6 discarded by the common abandonment toner bottle 5001 which prepared the abandonment toner discharged from said cleaning equipment 700,701 on the other hand in the bottom location of image formation equipment 119 through the abandonment toner guidance ways L1, L2, L3, L4, and L5 is other one example of this invention, for example, the image formation equipment 120 of a color printer is shown. In order for 300,301,302,303 to be a semiconductor laser emitter, a polygon mirror and ftheta lens, and the image exposure means that built in the reflective mirror respectively and to perform development for yellow (Y), a Magenta (M), cyanogen (C), and black (BK) in drawing, the process unit 500,501,502,503 for image formation is formed in said image exposure means 300,301,302,303 and lengthwise direction like drawing 5 . And it is prepared in the lengthwise direction by turns to said image exposure means 300,301,302,303 and the suspension member 201,202 turning around the process unit 500,501,502,503 for image formation in the condition of having put in accordance with the belt-like imprint object 200 which carried out suspension. The electrification machine 900, the developer 600 equipped with the toner supply section, the imprint machine 203, and cleaning equipment 700 are respectively formed along the hand of cut of the photo conductor drum 411 and this photo conductor drum 411, and said process unit 500,501,502,503 for image formation is constituted by the appearance in which the photo conductor drum 411 is exposed from the image exposure means 300 formed in the upper part, and an electrostatic latent image is formed, as the process unit 500 for image formation shows like drawing 1 . Although said image exposure means 300,301,302,303 constituted as mentioned above and the process unit 500,501,502,503 for image formation do not carry out illustration by the guidance attachment components 400, 401, 402, 403, 404, and 405,406,407,408, by the projection member, the pin, etc., it shows around in a predetermined location and maintenance immobilization of them is carried out. Furthermore, the abandonment toner bottle 5001 which holds the abandonment toner after cleaning the photo conductor drum in said each process unit 500,501,502,503 for image formation is formed in the bottom location of image formation equipment 119. The abandonment toner guidance way L5 was respectively formed from other cleaning equipments with said cleaning equipment 700 rather than the abandonment toner guidance ways L1, L2, L3, and L4 and the cleaning equipment 701 formed in said belt-like imprint object 200, and it has connected with said abandonment toner bottle 5001.

[0034] A color picture is formed with the image exposure means 300,301,302,303 constituted as mentioned above, and the process unit 500,501,502,503 for image formation and the belt-like imprint object 200. The electrification machine 900 gives a charge to the 411st page of the photo conductor drum in the process unit 500 for image formation which develops a yellow toner (Y) first, an electrostatic latent image is formed in the 411st page of a photo conductor drum with the image exposure means 303 controlled by the picture signal of the input unit 111 which receives an external picture signal next, and the development of a yellow toner (Y) is started with a developer 600. Said belt-like imprint object 200 also starts migration in the direction of an arrow head to coincidence, on said belt-like imprint object 200, the imprint machine 203 is used and the yellow toner (Y) image formed in the 411st page of said photo conductor drum is imprinted. Next, the Magenta toner (M) image formed in the photo conductor drum 411 of the process unit 501 for image formation which has a Magenta toner (M) by image information by said same actuation It imprints by heavy doubling ***** 203 so that it may agree in the yellow toner (Y) image formed in said belt-like imprint object 200. Furthermore, the cyanogen toner (C) image formed in the photo conductor drum 411 of the process unit 502,503 for image formation which has a cyanogen toner (C) and a black toner (BK) by image information by said same actuation next, A black toner (BK) image is imprinted by heavy doubling ***** 203 so that it may agree in the toner image formed in said belt-like imprint object 200.

[0035] Furthermore, the black toner (BK) is contained by the developer 600 at said process unit 500 for image formation, and a black toner (BK) image is formed in the 200th page of a belt-like imprint object by said same

actuation.

[0036] The color picture by the color toner is formed in the 200th page of said belt-like imprint object in the above actuation, the belt-like imprint object 200 moves by the suspension member 201,202 to rotate, and a color picture moves it in the recording paper imprint member 104 direction. On the other hand, sheet paper cassette C which built in the recording paper P is prepared in the bottom location of image formation equipment 119, paper is fed to the topmost recording paper P with the feed roller 102, and, as for the recording paper P, guidance conveyance of one sheet of recording paper P is certainly carried out inside [108] a recording paper proposal by double-feed-prevention equipment 103. Said detail paper P once stops with the resist roller 1031, it starts feeding so that it may agree with the color picture formed in the 200th page of a belt-like imprint object, and it imprints a color picture on the detail paper P by said detail-paper imprint member 104. Next, after the recording paper P is conveyed by the heat anchorage device 105 and fixed to the recording paper P in said color picture, it is delivered to a paper output tray 1191 as the recording paper PA with the delivery roller 107.

[0037] After imprinting a color picture, the 200th page of a belt-like imprint object is cleaned with cleaning equipment 701, and a new image imprint is performed.

[0038] Moreover, the open door 1202 is formed possible [disconnection] by the pivot 1203 in said some of image formation equipments 120, and it becomes possible by opening this open door 1202 to open the upper part about the process unit 500,501,502,503 for image formation which contained said yellow toner (Y), the Magenta toner (M), the cyanogen toner (C), and the black toner (BK). The process unit 500,501,502,503 for image formation can be made to be able to show around by the guidance attachment component 402,404,406,408, it can pull out to the side, and toner supply can be performed easily [the toner compartment of a developer 600]. Furthermore, it is possible to detach and attach said process unit 500,501,502,503 for image formation simply through the guidance attachment components 401, 402, 403, and 404,406,407,408 separately, for example, repair at the time of failure or exchange of the photo conductor drum 411, cleaning, etc. can be performed quickly.

[0039] Drawing 7 discarded by the common abandonment toner bottle 5001 which prepared the abandonment toner discharged from said cleaning equipment 700,701 on the other hand in the bottom location of image formation equipment 120 through the abandonment toner guidance ways L1, L2, L3, L4, and L5 is other examples of this invention, for example, the image formation equipment 121 of a reproducing unit is shown. 300,301,302,303 is the image exposure means which built in the reflective mirror respectively, and like drawing 1, in order to perform development of yellow (Y), a Magenta (M), cyanogen (C), and black (BK), it makes said image exposure means 300,301,302,303 a bottom location, and it combines the process unit 500,501,502,503 for image formation with a semiconductor laser emitter, and a polygon mirror and theta lens by the pair respectively so that it may become an upper location. And along with the belt-like imprint object 200 bottom which carried out the suspension of the process unit 500,501,502,503 for image formation horizontally to the suspension member 201,202 to rotate, it installs like illustration. The electrification machine 900, the developer 600 equipped with the toner supply section, the imprint machine 203, and cleaning equipment 700 are respectively formed along the hand of cut of the photo conductor drum 411 and this photo conductor drum 411, and said process unit 500,501,502,503 for image formation is constituted by the appearance in which the photo conductor drum 411 is exposed from the image exposure means 300 formed in the bottom location, and an electrostatic latent image is formed, as the process unit 500 for image formation shows. Although illustration does not carry out the process unit 500,501,502,503 for image formation to the image exposure means 300,301,302,303 constituted as mentioned above to the guidance attachment components 400, 401, 402, 403, and 404,405,406,407 so that it may be arranged by the vertical pair, by the projection member, the pin, etc., it shows around in a predetermined location and maintenance immobilization is carried out. Furthermore, the abandonment toner bottle 5001 which holds the abandonment toner after cleaning the photo conductor drum in said each process unit 500,501,502,503 for image formation is formed. From said cleaning equipment 700, this abandonment toner bottle 5001 is a bottom location of some, and is prepared in the side location of each of said process unit 500,501,502,503 for image formation. And the abandonment toner guidance way L5 was respectively formed from other cleaning equipments with said cleaning equipment 700 rather than the abandonment toner guidance ways L1, L2, L3, and L4 and the cleaning equipment 701 formed in said belt-like imprint object 200, and it has connected with said abandonment toner bottle 5001.

[0040] Furthermore, the exposure section 113 which established the manuscript base 117 in the upper part of

image formation equipment 121 at this example, and formed respectively the photo detectors 116, such as the exposure lamp 114 which exposes a manuscript, the optical system 115 including a mirror, and CCD which receives a manuscript image, prepares, is carried out, and is prepared possible [disconnection] with the belt-like imprint object 200 to image formation equipment 121 by using the shaft 2011 of said suspension member 201 as a pivot.

[0041] A color picture is formed with the image exposure means 300,301,302,303 constituted as mentioned above, and the process unit 500,501,502,503 for image formation and the belt-like imprint object 200. Sequential exposure of the color copy D on the manuscript base 117 is first carried out with the exposure lamp 114, image information is inputted into a photo detector 116 through optical system 115, and said image information is further inputted into an input unit 111. Moreover, the electrification machine 900 gives a charge to the 411st page of the photo conductor drum in the process unit 500 for image formation which develops a yellow toner (Y) to coincidence, an electrostatic latent image is formed in the 411st page of a photo conductor drum with the image exposure means 300 currently controlled by the picture signal of said input unit 111 which receives the aforementioned image information next, and the development of a yellow toner (Y) is started with a developer 600. Said belt-like imprint object 200 also starts migration in the direction of an arrow head to coincidence, on said belt-like imprint object 200, the imprint machine 203 is used and the yellow toner (Y) image formed in the 411st page of said photo conductor drum is imprinted. Next, the Magenta toner (M) image formed in the photo conductor drum 411 of the process unit 501 for image formation which has a Magenta toner (M) by image information by said same actuation It imprints by heavy doubling ***** 203 so that it may agree in the yellow toner (Y) image formed in said belt-like imprint object 200. Furthermore, the cyanogen toner (C) image formed in the photo conductor drum 411 of the process unit 502 for image formation which has a cyanogen toner (C) by image information by said same actuation next It imprints by heavy doubling ***** 203 so that it may agree in the toner image formed in said belt-like imprint object 200. Furthermore, the black toner (BK) is contained by the developer 600 at the process unit 503 for image formation, and a black toner (BK) image is formed in the 200th page of a belt-like imprint object by said same actuation.

[0042] The color picture by the color toner is formed in the 200th page of said belt-like imprint object in the above actuation, and the belt-like imprint object 200 moves in the recording paper imprint member 104 direction by the suspension member 201,202 to rotate. On the other hand, sheet paper cassette C which built in the recording paper P is prepared in the bottom location of image formation equipment 121, paper is fed with the feed roller 102 which feeds paper to the topmost recording paper P, and, as for the recording paper P, guidance conveyance of one sheet of recording paper P is certainly carried out inside [108] a recording paper proposal by double-feed-prevention equipment 103. Said detail paper once stops with the resist roller 1031, it starts feeding so that it may agree with the color picture formed in the 200th page of a belt-like imprint object, and it imprints a color picture on the detail paper P by said detail-paper imprint member 104. Next, after the recording paper P is conveyed by the heat anchorage device 105 and fixed to the recording paper P in said color picture, it is delivered to a paper output tray 1091 as the recording paper PA with the conveyance roller 106 and the delivery roller 107.

[0043] After imprinting a color picture, the 200th page of a belt-like imprint object is cleaned with cleaning equipment 701, and a new image imprint is performed.

[0044] As shown in drawing 8, this example can open the exposure section 113 and the belt-like imprint object 200 like illustration by using the shaft 2011 of the suspension member 201 as a pivot. It becomes possible to open the upper part of the process unit 500,501,502,503 for image formation which contained said yellow toner (Y), the Magenta toner (M), the cyanogen toner (C), and the black toner (BK) by opening centering on this shaft 2011. Toner supply can be easily performed by opening the lid 800 formed in the toner compartment of the developer 600 formed in the process unit 500,501,502,503 for image formation. Furthermore, in order for 411st page of some photo conductor drums of said process unit 500,501,502,503 for image formation to be outside exposed in said open actuation, as shown in drawing 8, it moved to the exposure of the 411st page of a photo conductor drum, and the covering 4111 for photo conductor drums shown in drawing 7 is protected from outdoor daylight. The moving method of the covering 4111 for photo conductor drums may prepare the connection member which is interlocked with open actuation of said exposure section 113 and the belt-like imprint object 200, and operates, or may perform it manually.

[0045] In this example, although the configuration which opens said exposure section 113 and the belt-like

imprint object 200 to coincidence was shown, in the case of a printer, it is not necessary to form the exposure section 113 which exposes Manuscript D, therefore it should open only the belt-like imprint object 200 by using the shaft 2011 of the suspension member 201 as a pivot, for example.

[0046] In that case, it is possible to detach and attach said process unit 500,501,502,503 for image formation more simply than the guidance attachment component 401,403,404,406 top, for example, repair at the time of failure or exchange of the photo conductor drum 411, cleaning, etc. can be performed quickly.

[0047] The abandonment toner discharged from said cleaning equipment 700,701 on the other hand is discarded by the common abandonment toner bottle 5001 through the abandonment toner guidance ways L1, L2, L3, L4, and L5.

[0048]

[Effect of the Invention] This invention is installing mutually two or more process units for image formation which have two or more image exposure means for color picture formation, an electrification machine and a photo conductor drum, a developer, etc. along with belt-like imprint dignity in claim 1 as mentioned above. While being able to perform attachment and detachment easily from image formation equipment with toner supply of a developer, without being interrupted with said image exposure means Since the image exposure means and the process unit for image formation for yellow, a Magenta, cyanogen, and black can be considered as a common configuration, the increase in efficiency and manufacturing cost of an assembly can be made cheap.

[0049] Since it is mutually installed along with belt-like imprint dignity, it can detach [when constituting this invention to a reproducing unit / by moving an up **** beam manuscript exposure means outside / with toner supply] said two or more process units for image formation in claim 2, and attach from image formation equipment easily, without being interrupted with said image exposure means.

[0050] In claim 3, it can detach [said belt-like imprint object is installed horizontally, and / with toner supply] by said two or more image exposure means and installing mutually two or more process units for image formation along said horizontal belt-like image support side and attach from image formation equipment easily, without being interrupted with said image exposure means.

[0051] In claims 4 and 5, it can detach [it inclines in a **** location and said belt-like imprint object is arranged, and] two or more process units for image formation by said two or more of said image exposure means and carrying out inclination side-by-side installation of two or more process units for image formation by turns along with said inclined belt-like imprint dignity and attach from image formation equipment easily, without being interrupted with said image exposure means.

[0052] In claim 6, since the abandonment toner respectively cleaned by the cleaning equipment of the photo conductor drum prepared in said two or more process units for image formation and the cleaning equipment of a belt-like imprint object is recoverable with a common recovery means, the maintenance of image formation equipment becomes easy.

[0053] In claim 7, it can detach [two or more image exposure means and two or more process units for image formation are prepared in the bottom location of said belt-like imprint object, and] with toner supply and attach from image formation equipment easily, without being interrupted with said image exposure means by opening said belt-like imprint object.

[0054] When two or more image exposure means and two or more process units for image formation are prepared in the bottom location of said belt-like imprint object and it carries out to said belt-like imprint object and reproducing unit, it can detach [by moving outside the manuscript exposure means formed in the upper part, / the process unit for image formation is opened wide, and / with toner supply] in claim 8, and attach from image-formation equipment easily, without being interrupted with said image exposure means.

[Translation done.]

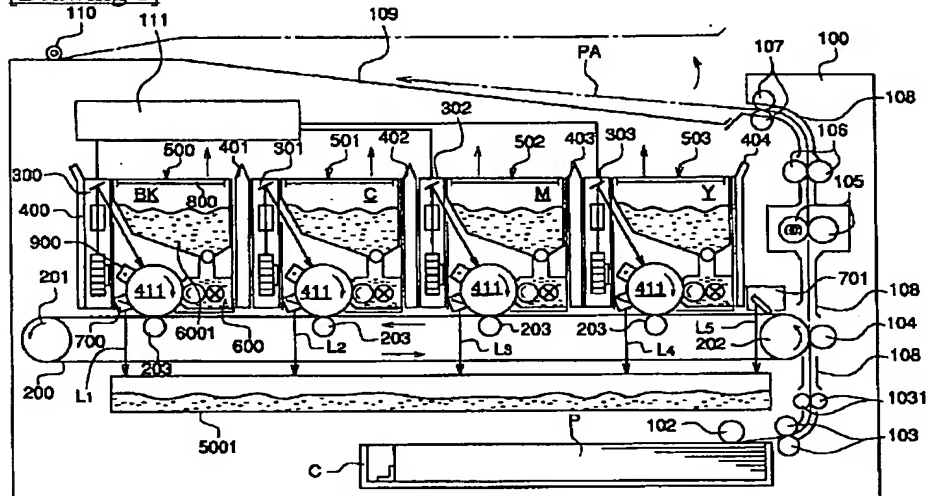
* NOTICES *

JPO and NCIPi are not responsible for any damages caused by the use of this translation.

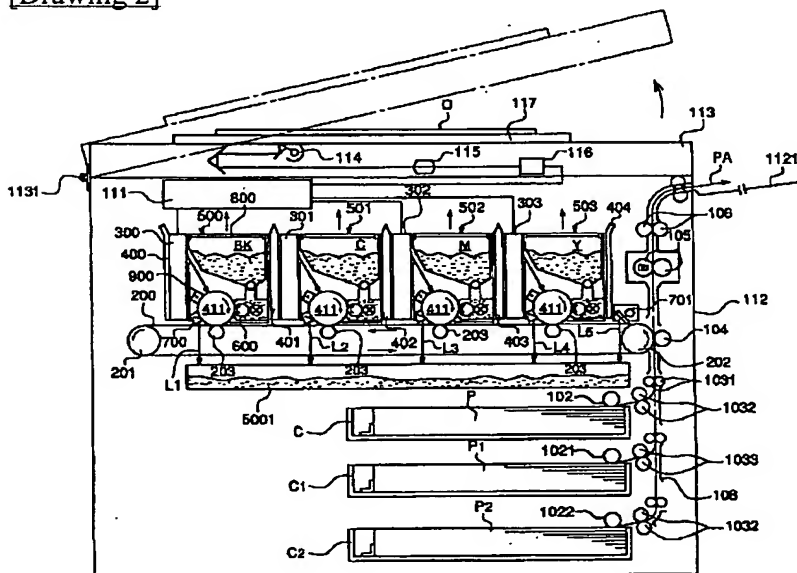
1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. **** shows the word which can not be translated.
3. In the drawings, any words are not translated.

DRAWINGS

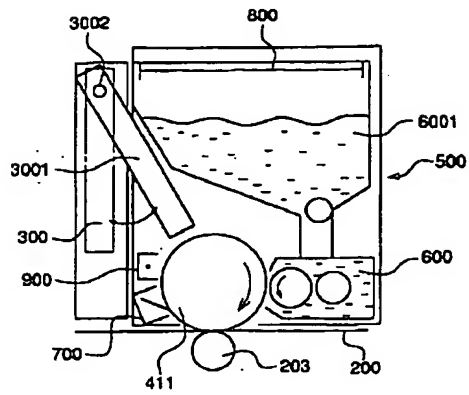
[Drawing 1]



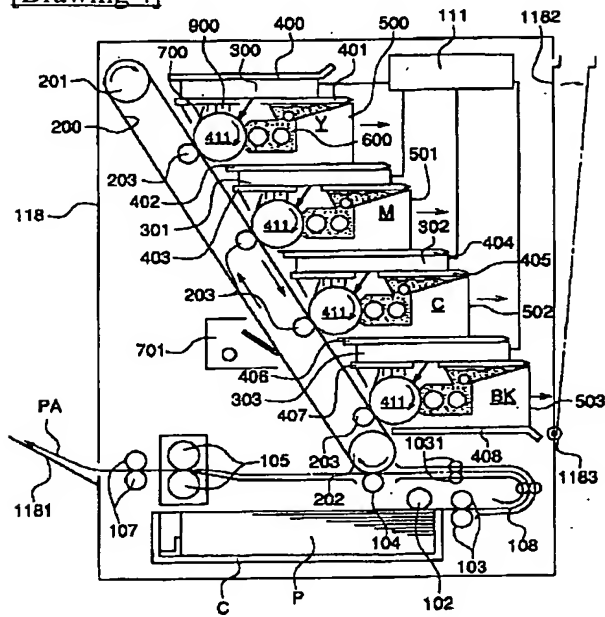
[Drawing 2]



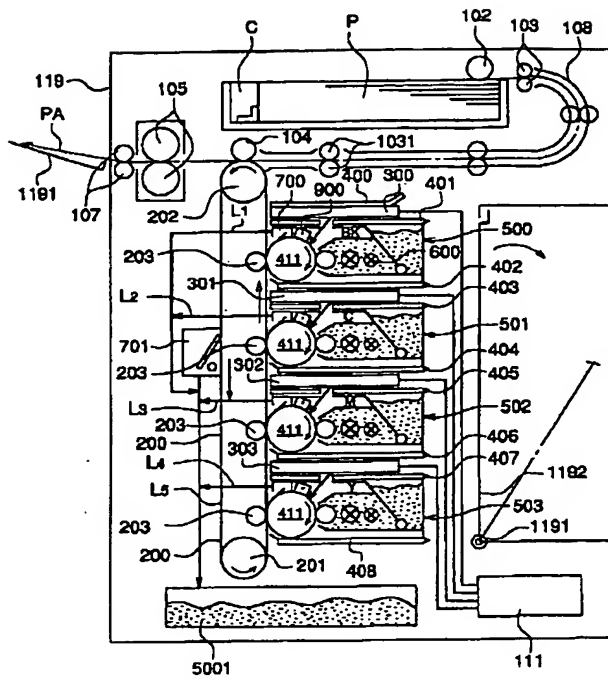
[Drawing 3]



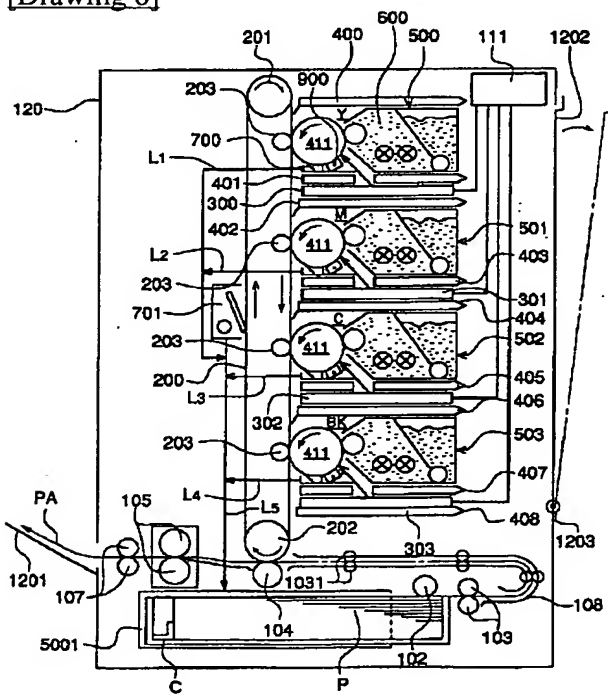
[Drawing 4]



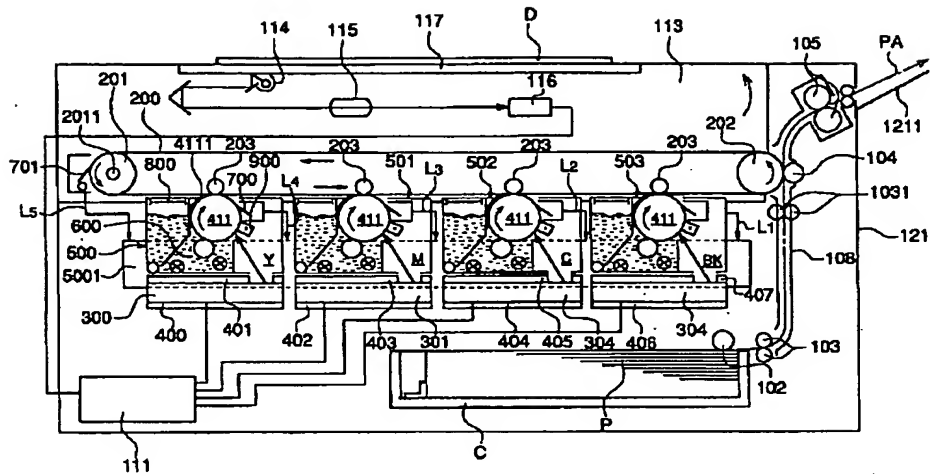
[Drawing 5]



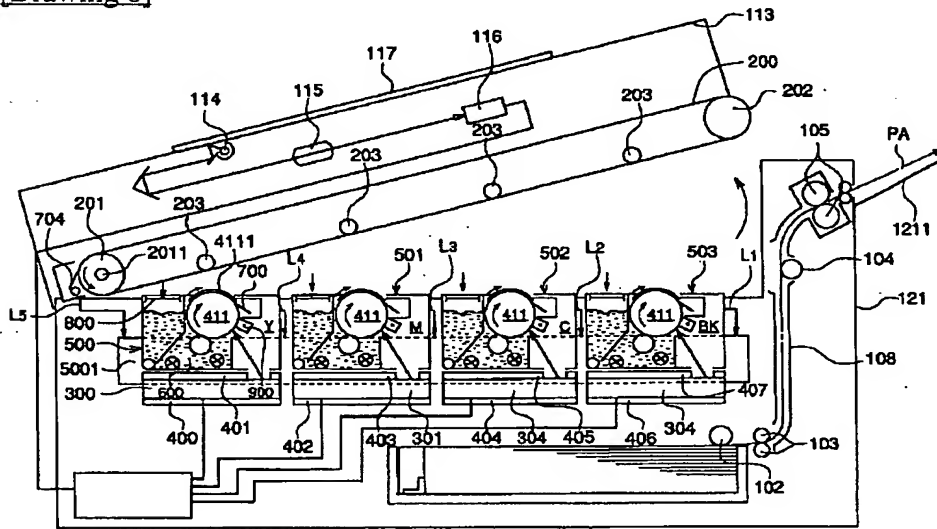
[Drawing 6]



[Drawing 7]



[Drawing 8]



[Translation done.]